

**TRAINING**

Training in the use of computers is essential for the success of any business. The National Computing Centre Limited (NCC) offers a wide range of courses for individuals and organisations.

**Training Courses:**

- Introduction to computers
- Word processing
- Spreadsheets
- Database management
- Systems analysis
- Programming

**Training for Business:**

- Management information systems
- Decision support systems
- Expert systems
- Computer-aided design
- Computer-aided manufacturing

**Training for the Public:**

- Home computing
- Personal computers
- Local area networks
- Internet

**Training for the Government:**

- Public sector information systems
- Government procurement
- Government security
- Government standards

**Training for the Education Sector:**

- Computer-aided learning
- Computer-aided assessment
- Computer-aided administration
- Computer-aided research

**Training for the Health Sector:**

- Computer-aided diagnosis
- Computer-aided treatment
- Computer-aided research
- Computer-aided administration

**Training for the Financial Sector:**

- Computer-aided trading
- Computer-aided risk management
- Computer-aided research
- Computer-aided administration

**Training for the Manufacturing Sector:**

- Computer-aided design
- Computer-aided manufacturing
- Computer-aided research
- Computer-aided administration

**Training for the Retail Sector:**

- Computer-aided sales
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Service Sector:**

- Computer-aided customer service
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Public Sector:**

- Computer-aided public services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Private Sector:**

- Computer-aided business services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Non-Profit Sector:**

- Computer-aided social services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Government:**

- Computer-aided government services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Education Sector:**

- Computer-aided education services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Health Sector:**

- Computer-aided health services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Financial Sector:**

- Computer-aided financial services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Manufacturing Sector:**

- Computer-aided manufacturing services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Retail Sector:**

- Computer-aided retail services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Service Sector:**

- Computer-aided service services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Public Sector:**

- Computer-aided public services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Private Sector:**

- Computer-aided private services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

**Training for the Non-Profit Sector:**

- Computer-aided non-profit services
- Computer-aided marketing
- Computer-aided research
- Computer-aided administration

# Computer Weekly

Thursday, March 29, 1981

**COMPUTER FLOORS**

Anti-static carpet  
Anti-static vinyl  
Matting

MAHVLIN CARPET & FLOORS  
Duke St. Eddard 24155

## NEWS BRIEF

### Bid for ICL denied

RUMOURS from the city that Siemens of West Germany is making a bid to acquire all or part of ICL have been denied by ICL and by Siemens in Munich. The rumours are said to have been started by "state hawks", disgruntled shareholders, who bought ICL stock in the hope that it would go up in value.

ICL has revealed that it is in close and regular contact with the government about its "longer term future", adding that Information Technology Minister Kenneth Baker is closely involved in the talks.

### £18m contract

GEC has won an £18 million contract to manufacture British Telecom digital PABXs and has gained type approval for the SL-1LE, the largest of the SL-1 range of digital PABXs made under licence from Northern Telecom of Canada. The company has now sold over 40 SL-1s to customers which include Esso and ICI and aims to export both systems in the future.

### Redifon recruits

REDIFON is recruiting about 50 staff to back its activities in the viewdata and office systems markets. The jobs include consultants, systems analysts, design engineers, customer engineers and sales staff for the UK and overseas.

### Many at show

DESPITE a £1 admission charge for the first time at last week's Microsystems exhibition and conference, attendance was at its highest level ever - 6,308 visitors, 14% up on the 1980 show. One of the star attractions of the three-day exhibition was Clive Sinclair's £70 personal computer, unveiled to the public for the first time.

## National strike called off by Health Service

NATIONWIDE strike action within the National Health Service regional computer centres was avoided last week after the intervention of the government's Advisory, Conciliation and Arbitration Service, ACAS.

An agreement on an orderly return to work has led to most centres working normally, though the Manchester-based North-West Regional centre was still disrupted earlier this week.

The national dispute is over a union claim for between £500 and £1,000 per person for computer staff in the centres to bring their wages up to those claimed for similar jobs in private industry. The main union involved, the National Association of Local Government Officers (NALGO), estimates this would cost £1.2 million a year.

A Department of Health and Social Security spokesman said the management side had offered a total of £700,000, with distribution still to be agreed. At present wage increases are restricted by government cash limits to 6%.

Last Friday Sir Sidney King, chairman of the management side of the administrative and functional committee, the sub-group of the Whitley Council which deals with the wages of computer staff, met fellow functional committee chairmen in a bid to seek extra cash from their areas for the computer sector. The Whitley Council is the forum for management and

staff to negotiate wages across the National Health Service. Lifting the action has meant that cheques totalling £15.20 million across the country have been released for payment. They had been processed by the computer centres but not dispatched.

Trouble at the Manchester centre in Prestwich Hospital is continuing because, according to a NALGO spokesman, the management side had indicated it intends to stop superannuation and holiday entitlement covering the period of the strike. The initial action flared up at this centre after two senior managers "seized" cheques worth £9 million which had been processed but not paid, during a union work-to-rule.

## UK lets slip a promising product

by Claire Gooding

THE British micro program development and generating tool named The Last One has been refused funding by Unilever Computer Services (UCS) and now seems likely to be taken up in the US.

The system, from D.J. "AI" Systems in Ilminster, Somerset, uses techniques based on artificial intelligence to generate programs, asking detailed questions to flesh out an outline which can be designed by a non-programmer at a level similar to flowcharting.

Its claimed ability to relieve programmers of the drudgery of coding and allow them to generate programs from flowchart designs has brought an enthusiastic reception from parts of the software community.

But others say that a program designed to write programs is

pitched at too low a level if it still needs flowcharts (as The Last One does) and that, in any case, APL does the same job.

Although it is built on a concept which is very much geared to the present market, UCSL has decided that the business climate is against investment. Its present backer, Scotty Bamford of Eurotyre in Ilminster, has been seeking further funds to get the product commercially ready.

"The sort of money he's asking for isn't the kind of money we wanted in put into the product," UCSL's Alan Jones told Computer Weekly. "The idea's interesting but it comes at the wrong time for us, and after discussion with our US associates, Timesharing Inc and others we decided against it."

However, UCSL has plans of its own to make a similar product available in the mainframe world,

and Jones had praise for what the author of the system, David James, was trying to do.

"He's taken a feasible approach, and it's a leap forward from current generators. If it does all the things he claims it does then it's in front of its field."

The Last One has attracted much publicity, partly because of its name and the personal story behind its author, a former millionaire who lost his fortune because of his obsession with computing. But so far, firm interest in marketing it has come only from overseas.

"We would have loved the interest to come from the UK," said David James, "but although lots of people came down to see the system and were over the moon about it, nothing happened. The substantial interest, 99.9% of it, has come from the US."



Pant'On, chairman of Telecomputing

## Control of ECS attempt

BY Keith Jones  
BERNARD PANT'ON, chairman of Telecomputing, was in California early this week attempting to take a controlling interest in ECS Microsystems, his opponent in a continuing legal battle. The California firm has been making moves that could drastically dilute the shares Pant'On wants to buy.

ECS Microsystems failed in a bid a few weeks ago to freeze Telecomputing assets, its stated aim being to retrieve \$450,000 owed by Telecomputing on hardware it supplied for the firm's TECS 4050 microcomputer.

Telecomputing is suing ECS Microsystems in California for \$12 million, alleging that the kit was faulty and also charging ECS with breaching Telecomputing's exclusive distributorship for ECS machines in Europe.

## WP firm for Ireland

by Rory Johnston

US word processors are to be built in Ireland following the takeover by Minnesota manufacturer CPT of the minicomputer plant abandoned by Northern Telecom. A desire to serve better the booming European market is given as the reason for the move by CPT president Dean Schell, who presided over the \$100 million for 1981, up from \$60 million in 1980, 30% coming from overseas.

The plant in Ballincollig, County Cork, used until January to build Data 100 minis, will employ 50 people initially, many of these from the laid-off Northern Telecom staff. The Irish Industrial Development Authority encouraged CPT's takeover with tax incentives, equipment grants and training.

At the same time CPT has announced upgrades to its two models of stand-alone word processor, consisting of exp memory and additional software facilities such as mail merge functions. In addition to these higher-priced options a low-cost printer will be offered later this year.

The Cork plant will be CPT's first overseas, and one of the first for any of the specialist US word processor manufacturers. CPT is especially strong in Europe, because it has a marketing arrangement with CII-HB in France; 17 different language versions are offered.

**BARRIERS?**  
Post Office Approvals P  
019023364/019021886  
Connecting to Datel P  
**BLUEDOWN**

£200 million guarantee puts spotlight on board

## Top changes soon at ICL

by Keith Jones

CHANGES in top management at troubled ICL now look fairly certain following the government's decision to keep the company's head above water by guaranteeing an extra £200 million worth of loans from ICL's main bankers over the next two years. ICL has already taken up most of its existing £70 million worth of bank loan facilities.

Commenting on the government's move, Information Technology Minister Kenneth Baker hedged questions about the government's guarantee being conditional on management changes at ICL. He pointed out that the terms of the guarantee were confidential, but admitted that the ICL management was being "watched".

Announcing the government help in the Commons, Industry Secretary Sir Keith Joseph used the government's position as a big ICL customer as his justification for the move.

He commented, "To protect this special interest we have, therefore, given a positive response to a proposal that the government should give a limited temporary measure of support for ICL."

He added, "Such a guarantee will not lead to any public expenditure unless it is called. I emphasise that it will be a limited amount and for a limited time."

Reaction in the City to the government action was distinctly cool. ICL's share price fell to 38p from the 46p price when trading was suspended just before the announcement. A spokesman for Sperry Corp in New York said that he had "no knowledge" of a reported 60p per share takeover bid by Sperry Uolva before the government made its statement.

Welcoming the loan arrangements, ICL said that its bankers - Midland, Barclays, National Westminster and Citibank - had agreed to increase their existing facilities to £270 million for up to two years.

In its statement the company added that it was "unusually difficult to look ahead" but repeated chairman Philip Chappell's prediction at the ICL annual meeting

that losses in the second quarter of the current financial year would be less than the £20 million loss in the first quarter and that the company would break even in the second half of the year. But Chappell admitted that this improvement would depend on there being no further deterioration in demand.

In the discussions in the Commons that followed Sir Keith Joseph's statement, shadow Industry Secretary John Garrett welcomed the decision but said that limited, temporary support was no substitute for a policy and a plan for information technology such as the French or Japanese had.

Referring to the present government's disposal of the National Enterprise Board's 25% holding in ICL last year (which raised over £30 million at 120p a share), Garrett commented: "It is now clear that the sale of ICL shares by the NEB on government instructions was misguided, since ICL is now back in the situation where it is suitable for the NEB to take it over on the present government's criteria for a rescue by the NEB."

## Privacy law confusion

by Rory Johnston

A MIXTURE of relief and bewilderment was the reaction of the computer industry to Home Secretary William Whitelaw's announcement that the government had accepted in principle the need for data protection legislation. His statement however left many questions unanswered, such as how the proposed codes of practice and regulations would be policed, and when legislation might be introduced.

Whitelaw was specific that there would be no Data Protection Authority, because of the cost involved for both the private and public sectors. There would be a public register, he said, on which users of automatic systems would have to enter themselves, as well as having to "comply with other requirements".

At the same time a working party of the Computing Services Association has recommended that an even simpler system of privacy protection for individuals be introduced, entailing the minimal legislation required to satisfy the Council of Europe's convention. This would give individuals the right to

sue for breaches of privacy and have the Ombudsman investigate complaints against the public sector.

A register would not be a good thing because of its cost and the danger of its being used with criminal intent, said committee member Magdalena Gardner-Brown of Contact. Manual files would be included in the laws proposed by the DCA, which is worried about other countries using data protection as a non-tariff barrier to trade.

Initial 3380 shipments in the US were originally expected to start about now, but have been delayed to the fourth quarter of this year.

Plug-compatible disc subsystems supplier, Memorex is expecting the 3380 delay to boost demand even further for its 3652 drive, a double density equivalent of the IBM 3350. Orders for the 3652 leapt last year after uncertainty among users about IBM's plans were cleared up by the 3380 announcement.

Mike Kitching, managing director of Memorex UK, described demand for the 3652 now as "frenzied". At the same time he warned of a rebuilding six-month delay in 3652 shipments.

64K RAMs sold

SALES of 64K dynamic RAMs are getting under way with so far orders from Control Data for \$1 million worth from Fujitsu and Motorola. The 50,000 units are to be supplied in two halves by the two companies.

Agreement

THE office division of Northern Telecom is increasing its presence in Europe through an OEM agreement with Redifon/CMC.

## Technology snags delay IBM discs

by Keith Jones

A SERIOUS shortage of large-scale disc subsystems for capacity served IBM mainframes will be the most dramatic effect of a delay up to eight months in the first shipments of IBM's 1300 megabyte hard disc drive, the 3380.

No doubt wanting to pre-empt rumours about its problems, IBM came out into the open by making a statement about the delay.

IBM in the UK said that a new delivery schedule would be announced in the third quarter of this year with the first shipments now probably taking place in the second quarter of 1982. They were originally intended to start in the 1981 third quarter.

But IBM gave no idea of the precise nature of the problems, except that they concerned the 3380 hardware.

IBM admitted, "We have problems like everyone else."

Industry speculation centres on the technologically innovative parts of the 3380, in particular the "thin film" copper coil read/write head being developed at IBM's magnetic recording products centre at San Jose, California.

Initial 3380 shipments in the US were originally expected to start about now, but have been delayed to the fourth quarter of this year.

Plug-compatible disc subsystems supplier, Memorex is expecting the 3380 delay to boost demand even further for its 3652 drive, a double density equivalent of the IBM 3350. Orders for the 3652 leapt last year after uncertainty among users about IBM's plans were cleared up by the 3380 announcement.

Mike Kitching, managing director of Memorex UK, described demand for the 3652 now as "frenzied". At the same time he warned of a rebuilding six-month delay in 3652 shipments.

Op Spot

15  
Data Analysis 16  
People 17  
Products 18/19  
Peripherals feature 22/24  
Computers 25  
Computer news 26  
Sales 27

Jobs: Pages 26/47

## INSIDE THIS WEEK'S ISSUE

Telephone office systems challenge 2  
Computer staff half cash 3  
Discs moves into desk-top micros 5  
Consultancies beat the slump 11  
Agreement near on Euro viewdata standard 48

DF exports help UK trade 2  
Fate of the show 4  
Time sharing 5  
Printed conference 6  
Software file 7  
Micro News 9  
Company News 10/11  
Gib's Mythology 12  
Letters to the Editor 13  
Programmer's Page 14



Mainframe handling of Eurobond deals at Chemical Bank's London base will be switched wholly to micros under a powerful multi-user scheme now being considered.

## Bank switches to micro dealing

by Claire Gooding

A CITY-BASED international bank is running its Eurobond trading operations on micro, under the multi-user Farnos operating system, and intends to use them to replace its IBM mainframe.

As deals are confirmed, the system gives information on yields, profits and losses. The details of a deal are then transmitted via a time sharing network to the clearing office in Europe and other branches as far afield as Hong Kong.

After searching for a real time system to cope with front-office operations, Chemical Bank International plumped for the Farnos-based system from Microtek in Or-

plington. With co-operation from the bank, Microtek produced the system to be up and running in six weeks, it says.

"We find it excellent," said Bob Fuller, head of the DP task force at Chemical Bank. "There's even a possibility it will be marketed outside as a Eurobond system. I believe it is the most advanced Eurobond trading system currently available; it does everything we want it to and more."

The back-office system will deal with the clearance and transference of all monies traded during the day, and will link with the automatic clearing bank systems Euroclear and Cedel.

**RAIR Terminal CHOICE**

**DIABLO 630**

Industry standard daisy-wheel printer with metal and plastic wheels, graphics, two colour printing

**£1650**

RAIR 30-32 Neal Street, London WC2 Tel 01-836 4863

**Maintenance battle**

From front page

machines, Computron Holland. But the Dutch company's proprietor, Wim van der Beek, is hesitant about dealing with either.

"Radus has approached me but all they want to buy is spare parts and that's not of interest to me," he says.

He added, "I've met Mr Gale but I have absolutely no idea about his background. Van der Beek says he was paid about £70,000 at the time of Scope's collapse."

The only company Computron Holland is supporting is the 50 per cent owned Computron Business Machines, whose other half is owned by former Computron employee Tony Haylock.

Gale has according to Haylock, approached him with an offer to franchise Computron Business Machines for the maintenance agreement for the southern part of the country, an offer Haylock has turned down because, he says, it also involved a commitment to sell 2,500 units a year.

Meanwhile Gale has entered a trade show, the Numerical Control Exhibition at Wembley on March 30, under the name of Computron UK, a name he says he has registered. The stand was booked through the finance director of Offshore, Mr Buckley.

**COMPUTER FINANCING INTERNATIONAL LIMITED**

Standard House, 25 Old Broad Street, London WC1X 3TB

AVAILABLE

4331 - L02  
4341 - K01  
4341 - L01

April  
May  
June

TELEPHONE 01-431 7710 or 01-259 4155 TELEX 9554/24

**DATA GENERAL**

Prices start from £4460 for the MP100 and £5076 for the MP200 systems. Systems range from floppy disc through cartridge to Winchester storage.

Comma offer "off the shelf" delivery of complete Micro Nova Packaged Systems as well as Expansion Memories, Communications Options, Interfaces and comprehensive Operating Systems Software.

Data General Printers and Dasher Terminals are also available ex-stock.

**COMMA COMPUTERS LTD**

Branches in Birmingham, Bristol, London, Manchester

**BRENTWOOD (0277) 811131**

OEM DISCOUNTS AVAILABLE

**British Made Terminal for Data Capture and Local Processing**

Introducing the Cifer 2884 User programmable terminal at the top end of the 2800 range of compatible VDUs. The 2884 provides a full 64K bytes of User RAM, supporting industry standard CP/M operating system with built 280K byte floppy disc drive.

In addition to the disc processor system, a separate VDU processor provides all the features of the 2884 terminal which acts as a front end processor.

- Real 280 processor system
- Single and Double Density Disc Drives with DMA
- Full range of CP/M compatible software
- Industry standard 24 x 80 Display
- Top quality 100 key detachable keyboard
- Compact Housing

For further information on the complete 2800 range contact Cifer today

**CIFER SYSTEMS LIMITED**

Factory with South Western Sales  
Ave Way, Bowditch, Dorset, Wilt  
Tel: Melkham (0238) 704502, Telex: 448672  
Northern Area Sales  
Northampton House, 44 Northampton Way, Northampton  
Tel: Northampton (0604) 444444  
South Eastern Sales  
Portland House, 4 Creek Portland Street  
Tel: 01-836 3385 Telex: 241524

**Technology snags delay IBM discs**

IBM in the UK said that a new delivery schedule would be announced in the third quarter of this year with the first shipments now probably taking place in the second quarter of 1982. They were originally intended to start in the 1981 third quarter.

But IBM gave no idea of the precise nature of the problems, except that they concerned the 3380 hardware.

IBM admitted, "We have problems like everyone else."

Industry speculation centres on the technologically innovative parts of the 3380, in particular the "thin film" copper coil read/write head being developed at IBM's magnetic recording products centre at San Jose, California.

Initial 3380 shipments in the US were originally expected to start about now, but have been delayed to the fourth quarter of this year.

Plug-compatible disc subsystems supplier, Memorex is expecting the 3380 delay to boost demand even further for its 3652 drive, a double density equivalent of the IBM 3350. Orders for the 3652 leapt last year after uncertainty among users about IBM's plans were cleared up by the 3380 announcement.

Mike Kitching, managing director of Memorex UK, described demand for the 3652 now as "frenzied". At the same time he warned of a rebuilding six-month delay in 3652 shipments.

**British Made Terminal for Data Capture and Local Processing**

Introducing the Cifer 2884 User programmable terminal at the top end of the 2800 range of compatible VDUs. The 2884 provides a full 64K bytes of User RAM, supporting industry standard CP/M operating system with built 280K byte floppy disc drive.

In addition to the disc processor system, a separate VDU processor provides all the features of the 2884 terminal which acts as a front end processor.

- Real 280 processor system
- Single and Double Density Disc Drives with DMA
- Full range of CP/M compatible software
- Industry standard 24 x 80 Display
- Top quality 100 key detachable keyboard
- Compact Housing

For further information on the complete 2800 range contact Cifer today

**CIFER SYSTEMS LIMITED**

Factory with South Western Sales  
Ave Way, Bowditch, Dorset, Wilt  
Tel: Melkham (0238) 704502, Telex: 448672  
Northern Area Sales  
Northampton House, 44 Northampton Way, Northampton  
Tel: Northampton (0604) 444444  
South Eastern Sales  
Portland House, 4 Creek Portland Street  
Tel: 01-836 3385 Telex: 241524







## Message for London seminar on compatibility

## 'No need to buy IBM products to adopt SNA'

by Donald Kennett

IBM users will have to adopt IBM's Systems Network Architecture eventually, but will not have to buy IBM products exclusively to do it. That was the message last week from Saroj Kar, president of California-based consultancy Telecom Computer Technology, at a four-day seminar on compatibility with SNA, held in London by TCI and Interco Business Consultants of Richmond, Surrey.

The impetus would come from the attractiveness of IBM's application software, the elegance of its network management techniques and the fact that users were offered a complete system, tailored to their industries — for example banking, airlines, insurance and supermarkets.

Users had huge investments in getting applications working that they wanted to protect, said Kar. They would be offered a smooth migration path to SNA over the next four years or so, but support

for simple start-stop and bisynchronous terminals would be dropped from future releases of system software such as VTAM, which enables terminals to access application programs running in a mainframe, and the NCP network control program which runs in communications controllers.

SNA-compatible terminals or cluster controllers would then be required in order to work with the system. Most medium to large manufacturers of computer and terminal equipment were now putting some effort into emulating an IBM cluster control product, such as the 3274, and by 1984 he expected many manufacturers to be offering such emulations on the market. Telex, Nixdorf and Harris had announced SNA-compatible cluster controllers in the last year.

Univac, Honeywell, AT&T, Texas Instruments and Northern Telecom Systems Corp were all

developing products to work with SNA, just as plug-compatible manufacturers had learned in the past to design for compatibility with IBM systems.

Even an occasional need to link to an SNA system was enough to justify developing SNA-compatible products — for example, if a chain of hotels using Univac's Distributed Communications Architecture wanted to receive bookings from an airline's SNA-based reservations system.

By the late 1980s we would see products on the market that fitted in with the ISO structure for open systems interconnection, but in the meantime software products from independent companies would have small numbers of users compared with IBM products.

"IBM is saying loud and clear that you will only be safe with SNA if you use IBM products alone, but we are saying you don't have to," Kar concluded.



Bell Canada's Displayphone.

## Voice/datacom trial

BELL CANADA has introduced a desk-top unit that handles both voice and data communications. The Displayphone, as it is known, will be tested at about 250 North American business sites later this year.

The basic unit consists of a seven-inch black-and-white display, a telephone handset and two keyboards.

Bell Canada officials say that, given favourable reactions from the field trials, it may begin selling the unit during 1982.

The Displayphone allows the user to make calls on two separate lines. Both lines can handle voice communications, while only the second can handle data communications, via a built-in 300 bps modem coupler.

The unit has two keyboards.

One is directly in front of the display screen, and the other is concealed on a slide-out drawer. The first has a standard 12-key telephone pad, eight function keys and five programmable keys. The slide-out 55-button keyboard is used for data entry.

The Displayphone has 8K-bytes of random access memory and 32K-bytes of read-only memory. The RAM stores information entered by the user, including up to 81 telephone numbers. The unit also contains its own battery, so that memory is retained during power failures.

Extras include auto dialling, last number re-dial, a calculator function, clock and calendar display, and call timing. The Displayphone can also accept peripherals, such as printers and cassette recorders.

## Linking up 64 micros

by Eileen Stainer

A MULTIPLEXER for microcomputers that can tie together from two to 64 systems into one multi-user multi-function system has been developed by Corvus Systems in California.

Called Constellation, the multiplexer allows each microcomputer to access disc storage as if it were the only one connected, even if all the micros are in use. Maximum storage with a fully implemented network is between 10 and 80 megabytes.

Constellation can be used with most microcomputers available on the commercial market.

Prices for the multiplexer begin at \$750 with an eight-computer network and each interface after that is about \$250.

## Pets rule at Inspex show

by Chris Youatt

PET-based systems dominated the Measurement and Inspection Technology Exhibition in May 81, held recently at the Nuffield Exhibition Centre, near Birmingham.

Two of the systems on show were based on Pets that had been repackaged, with Commodore's blessing, to avoid looking like a computer system in an effort to reduce shop floor resistance to using them.

The first system was a statistical measuring unit made by Machine of Kenilworth. It cost £6,500 for hardware and £500 for software which could be tailored to customer requirement.

The Machsize system had a real time printer, 32 channels, standard keys, custom design interfaces and built-in analogue digital converters.

Vernon Instruments has repackaged a Pet into a gauging system that could measure up to 20 dimensions on a work piece. The software was programmed in line and had three tests for the piece pass, fail or rework.

The keyboard could be detached and a graphics printer was optional, the repackaged Pet costing about £10,500.

A menu-driven Pet-based calibration system from the Medical Physical Laboratory gauges up pieces up to one millionth of an inch, with software running on either magnetic tape cartridge or disc. It costs about £1,000 for the hardware and £250 for software.

Unit Inspection offered a Pet-based service for tube inspection time on the client's premises. The system works on the basis of analysing eddy currents.

Advanced Metrology Systems exhibited a precision measuring system based on a Pet design, dimensions down to one millionth of an inch.

The Pet interfaced to a surface measuring instrument via a plug-in interface, the system costing between £600 and £3,000.

Systems based on Commodore's Atari General and Hewlett-Packard kit were also exhibited.

## Digico moves into the desk-top micro market

by Keith Jones

BUOYANT UK microcomputer manufacturer Digico has moved into the desk-top microcomputer market with Prince, a Z80-based single screen machine running under the ubiquitous CP/M operating system. Priced between £1,500 and £4,500, it can operate in standalone mode or as an intelligent satellite to a Digico microcomputer, taking advantage of its large scale database.

The Prince launch is one of three major current events in the life of Digico. The other two are the opening of a new 42,000 square foot Northern headquarters in Leeds and the raising of £2 million additional capital from a private share placing by its holding company, Spanverne Investments (see Company News, page 11).

Spanverne managing director Ken Atkinson, said the money would be used for acquisitions, with peripheral manufacturers and service bureaux of most interest.

Prince slots into the Digico product line between the Regent VDU and the Consort, the smallest of the company's 16-bit machines.

Atkinson said that several microcomputer dealers were already interested in handling it, and pointed out that the complete Prince package included Cobol, Basic, PL/I, Pascal and database software on the systems side plus a full range of applications packages for both general accounting and

solicitors' accounting.

To maintain the machines Digico is offering a facility called Minimum Interruption Plan which will operate somewhat like the service for a rented TV, according to Atkinson. If a Prince machine goes down it will be replaced.

Atkinson emphasises the importance of Prince as a satellite to a bigger Digico system. He said that Digico had developed a protocol that enabled the CP/M file handler on Prince to communicate with the file handler on the Digico M28 system. He envisaged a network of Princes linked to an M28 and running most of the user's applications programs while the M28 acted as a large scale database system.



## Spreading the work

by Claire Gooding

HIGH STREET Jobcentres are needing the task of matching applicants with the right vacancies by using a message switching system to spread the word about jobs as they become available.

Jobcentres in London, Birmingham, Liverpool, Newcastle and Glasgow are now using Perkin-Elmer message switching systems, which were originally installed as an interim measure while the new defined Capital Mainframe system was being developed.

Firms with vacancies to fill can now contact their local Jobcentres with the details, which are entered

immediately on a terminal, with codes indicating where else in the area potential employees might be found.

In the relevant local Jobcentres, which might be anywhere else in the UK, the details are printed directly on to a card which is then pinned on the board for job-hunters to find.

"It brings more vacancies to a wider range of applicants, and for employers the net can be cast wider in the search," explained Andrew Hemmings of the Employment Service Division of the Manpower Services Commission. "It's a faster service to both employer and job seeker."

## Instant Arabic from CPT

CPT has sold Arabic translation on a word processing system — translation agency Tek Translation to what the company claims is a first for the translation market. An £80,000 order has been placed for 17 word processors and standard printers plus multi-lingual software in 10 languages other than Arabic.

Screen editing will be done by various operators in their own languages with final copy fed directly to film-setting equipment. Tek also intends to transmit copy to offices in Hong Kong and Houston as first stage towards establishing a worldwide network.

## Are You an AS User?

Perhaps you don't know you have an alternative... Using the INFO Database and Applications Development system on P&O Computer Services Remote Terminal Service (PORTS) we can provide a cost-effective alternative with improved facilities.

For further details on how you can benefit, please contact:

Marketing Department,  
P&O Computer Services Ltd.,  
47 High Street,  
Rushmore, Wokingham,  
Berkshire RG4 2JH  
Telephone (0235) 71111

P&O Computer Services Limited

## Bureau buys Rair time sharing

COMPUTER bureau Allen Computer Services of London has acquired the time sharing business of Rair, developer of the Black Box range of microcomputers. The move comes after a high growth in sales of the Black Box for Rair and allows the company to concentrate on this area and the new growth area of terminal products.

Dealers are being appointed countryside by Rair to handle end user marketing of the Black Box series, including the latest Black Box III line. Dealers will be able to offer customers facilities like the Rair Rental Scheme. This scheme provides rental contract periods of up to 12 months.

## ASSET will keep watch on cost accounting assets

by Eileen Stainer

FIXED asset accounting is the theme of a new software package for the IBM System/34 user, available from Interactive Database Systems based in London.

Called ASSET/34, the program completely supports all requirements of SSAP/12 for historic cost accounting and SSAP/16 for current cost accounting.

The system comprises a vehicle detail file which gives out reminders of taxing, plating, MOT testing and the like and produces a full range of analysis reports.

It also includes a property register which gives printed information on rent review, insurance and other reminders.

A finance file provides details of all financed items with agreement details and standing order amounts.

ASSET/34 is being installed currently in nine organisations, one with 20,000 assets to control and the company expects to release a version for the System/38 shortly.

Similar to IDS's market leader financial planning and general ledger system package called IN-SIGHT, the ASSET package has "prompt" displays and dispenses with the need for the user to have computing knowledge.

ASSET/34 interfaces with IN-SIGHT to provide a totally integrated management information system.

## US information policy doubts

by Rory Johnston

UNCERTAINTY is clouding the future of all information policy and regulation in the US, following the arrival of Ronald Reagan and his administration's preoccupation with cutting public spending. No replacement has yet been found for Henry Geller, head of the National Telecommunications and Information Agency, and Geller's ambitious plans for a national information policy look likely to be forgotten.

There is even a possibility that the NTIA could be converted from being part of the Department of Commerce into a small office in the White House, from where it

was involved by President Carter; or it could be abolished altogether.

Meanwhile its Bills on privacy and telecommunications have been dropped, and such issues as whether AT&T should be prevented from offering data processing remain unresolved.

The multi-front fight between the banking giant Citicorp and ADAPSO, the computing services association, is proceeding slowly, with a federal court and the Controller of the Currency waiting for the outcome of hearings before the Federal Reserve Board in May. ADAPSO is accusing Citicorp of competing unfairly in providing DP services that are subsidised by

its banking activities.

Counter-charges by Citicorp, that ADAPSO was trying to restrain trade by a "sham anti-trust action", were thrown out by the federal judge.

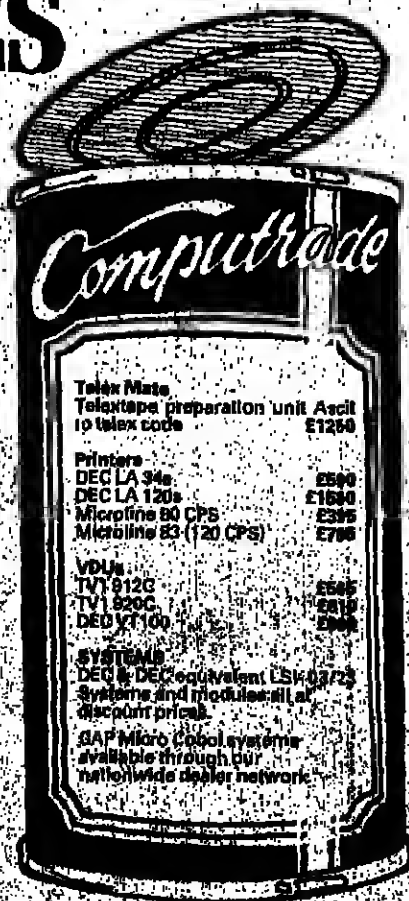
ADAPSO has recommended to the White House that Hugh Donoghue of Control Data, be made head of the NTIA, to give the agency "a practical understanding of industry," in the words of the president, Jerry Dreyer. Dismissing the NTIA would be "a terrible mistake," Dreyer said.

Meanwhile the 325 civil servants there have little to do, apart from advising on cutbacks to the funding of public television.

## WE CAN CUT PRICES

ALWAYS KNOWINGLY LESS EXPENSIVE

Show us an advertised or quoted price lower than we've invoiced you within seven days of ordering and we'll refund the difference or renegotiate your order.



01-688 2724/6  
**COMPUTRADE**  
Telex No. 946179

## Wilkes Computing

for  
**DEC SYSTEMS**  
VAX 11/780  
PDP 11/70, 11/34's,  
11/44's

PDP 11/03, 11/23's  
systems and  
software

VT 100 LA 120  
LA 34  
Home and  
Export Sales

Wilkes Computing  
Tel (0272) 25921 Telex 449205

## COMPUTER SUPPLIES

Extensive range of printer and typewriter ribbons available direct from manufacturer, i.e. CENTRONICS; DIABLO Multistrike; QUME Multistrike etc. and all makes of typewriters.

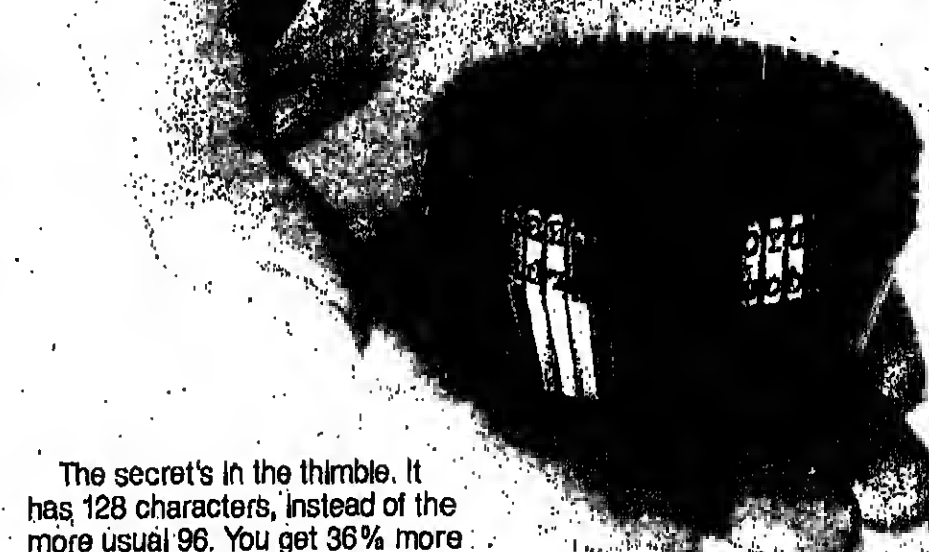
Data Cassettes — certified — ECMA 34 standard 8" floppy discs — certified. Rigid disk cartridges: 8MB, 16MB. Listing paper holders/stands. Floppy disk library cases. Extending library cases — 20 floppy disks. Fireproofed Data Storage Safes. Any quantity.

Phone, write or call: Adler Business Systems Ltd., Supplies Division, Leabank House, Holloway Road, Birmingham B11 1JH. Telephone (021) 643 5332.

special 24-page supplement  
**THE 16-BIT PROCESSOR**  
The new generation of 16-bit microprocessor systems can boost the performance of present day microcomputers. This means the "best" computer is now within the reach of any individual. The question is "Which system do you choose?" The April issue of *Elektron* contains a 24 page supplement giving a full survey of the field.  
On sale now, price 60p

**elektor**

## You have every reason in the world to switch to NEC's "thimble" printers. Here are 128 of them.

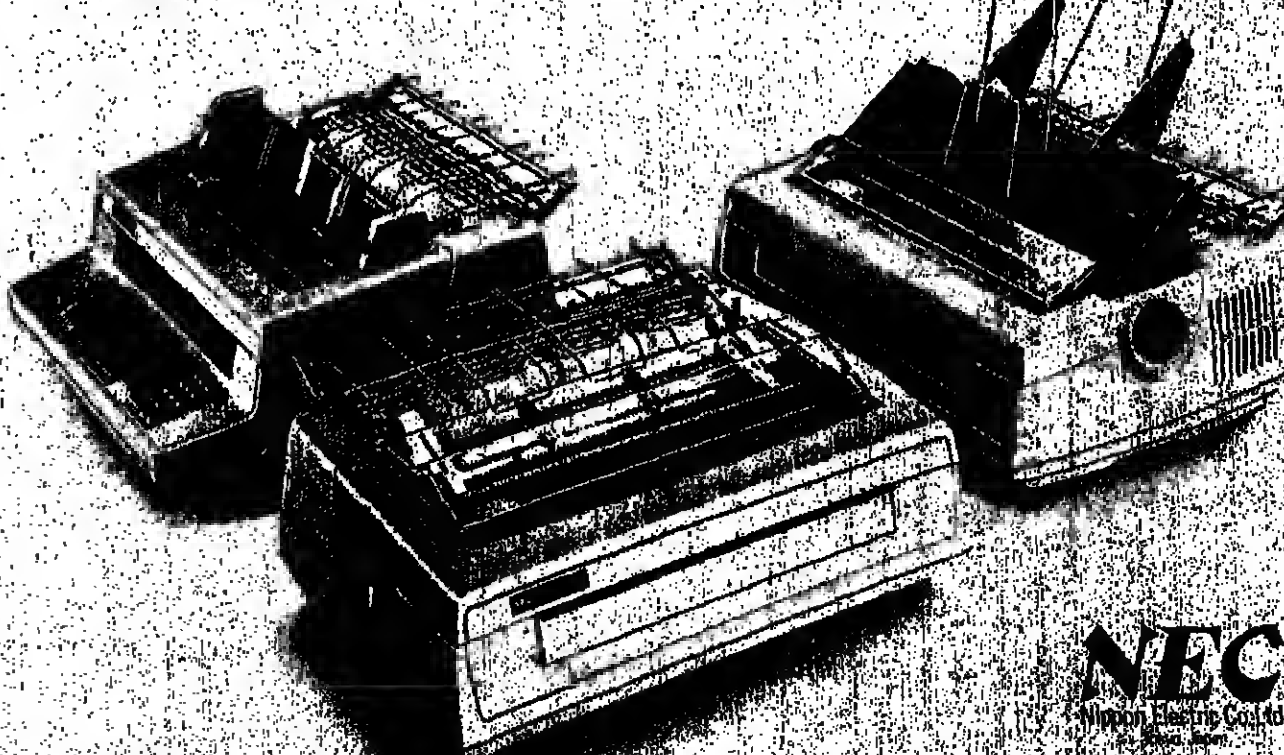


The secret's in the thimble. It has 128 characters, instead of the more usual 96. You get 36% more flexibility in handling paperwork than with most of the daisy-wheel and golf-ball print elements of other printers. In English, French, German, Scandinavian, name it. And one thimble will last more than 30 million clear impressions. Quietly, quickly.

And that's just for openers. Thanks to our own LSI and microprocessor technology, the NEC Spinwriter Series 5500, which comes in three models, gives you camera-ready print quality. You can plot,

graph, superscript, subscript. Tab horizontally or vertically. And print bidirectionally.

Changing thimbles and ribbons is a snap. Also, system modularity means your Series 5500 printer will grow as your requirements grow. And one of the finest things about it is that it really won't cost you a thing to switch. 7 Interface capabilities, including those for Diablo, QUME and Centronics, means the NEC Spinwriter is ready to work in your system right away. Get close to our thimble printers now.



For more information, please contact:  
NEC Telecommunications Europe Co. Ltd., NEC House, 100 Brooklands Avenue, Weybridge, Surrey TW20 2EX. Tel: (081) 608 1810. Telex: 32101  
Thorne Systems Ltd., Thorne Park Industrial Estate, Thorne, Doncaster DN8 3BB. Tel: Thorne (0464 4231547)



Donald Kennett reports on last week's conference on a Prestel service that is due to start up in the UK next year

## Data collection likeliest for viewdata gateways

DATA collection is currently the favourite application proposed for gateways from public viewdata services to third party databases, although they can also allow access to other services which it would be uneconomic to provide on Prestel's own computers.

At last week's conference on Prestel's Gateway organised by Systems Designers and British Telecom, Simon Wilders, the software engineer responsible for implementing Gateway, spoke of the "transformation" of Prestel from an information retrieval service to a data collection service.

And Ludwig Griehl of the Deutsche Bundespost, which initiated the provision of gateways on public viewdata, said that 80% of the frames on the third party computers connected to the Bildschirmtext viewdata service were designed for data collection.

SDL's information systems manager Alan Haines said the economic justification was often stronger for data collection than it was for data distribution.

Prestel research chief Keith Clarke said that the bulk of international debate had centred on display techniques and the terminal transmission scheme, on whether character attributes should be coded serially or in parallel, but that was not where the main problem lay. They lay in the computer network and the database structure, because people were going to make their money through quick and efficient access being available to their information.

British Telecom had been unimpressed by minor improvements in display quality made in some other countries, but had been impressed by Bildschirmtext's gateway. Application areas would include highly interactive services, rapidly changing information, capture and vetting of data in volume; extremely large databases and to cases where there were complex security requirements.

Advantages were that billing was taken care of, casual customers could be attracted and the network was in place to give local call access from most of the country.

He outlined plans for its introduction. By the end of the year, tests would be run with the first guinea-pig (or pioneer) gateway information providers. Their services would be available by next March. They would be attached via the PSS packet network to a Prestel centre having a light load but a large number of local users.

It would enable operating costs to be reduced by getting away from the present labour-intensive archiving methods and it would make it easier to take advantage of new technologies, such as packet switching, video-disc data archiving and Cambridge Rings or other local networks.

These were useful for connecting a number of computers together in a flexible way.

Third party database operators would have to implement X25, so as to attach to PSS, and the BT protocol designed for the German system, which was equivalent to the top four layers of the ISO open networking scheme, so as to provide the required user interface.

SDL's David Gilbert said that the BT protocol had been designed in modules related to the ISO networking scheme, so that as standards emerged for each layer the modules could easily be changed to comply with them.

Some parts of the protocol might be extended in future to cater for a wider variety of application requirements, including for example a computer-initiated dialogue.

SDL's Haines said companies were likely to take at least six months to implement a service on Prestel's Gateway, even with the availability of software products to handle the X25 and BT protocols. SDL planned to hold workshops at its Camberley headquarters. One-day planning workshops costing £150 a head were scheduled to start next month and two-day design workshops, costing £350, in May.

In a second phase starting in the middle of next year, gateways would spread through the country along with Prestel's new advanced network, Panda. The chief merit of the current network was that it had been set up quickly. Panda would make it easier to introduce new facilities, such as Gateway and a message service.

It would enable operating costs to be reduced by getting away from the present labour-intensive archiving methods and it would make it easier to take advantage of new technologies, such as packet switching, video-disc data archiving and Cambridge Rings or other local networks.

These were useful for connecting a number of computers together in a flexible way.

Third party database operators would have to implement X25, so as to attach to PSS, and the BT protocol designed for the German system, which was equivalent to the top four layers of the ISO open networking scheme, so as to provide the required user interface.

SDL's David Gilbert said that the BT protocol had been designed in modules related to the ISO networking scheme, so that as standards emerged for each layer the modules could easily be changed to comply with them.

Some parts of the protocol might be extended in future to cater for a wider variety of application requirements, including for example a computer-initiated dialogue.

SDL's Haines said companies were likely to take at least six months to implement a service on Prestel's Gateway, even with the availability of software products to handle the X25 and BT protocols.

SDL planned to hold workshops at its Camberley headquarters. One-day planning workshops costing £150 a head were scheduled to start next month and two-day design workshops, costing £350, in May.



Prestel research chief Keith Clarke

Ludwig Griehl from Deutsche Bundespost

## Room for more next month on West German viewdata

FROM next month a greater number of West German companies will be able to offer viewdata services on Bildschirmtext, when connections from private computers to Bildschirmtext gateway centres start being implemented via Datex-P, the West German public packet network, instead of via leased lines.

Ludwig Griehl from Deutsche Bundespost said that the full public service of Bildschirmtext would not start until 1983 and it would be different in many ways from the current version. The next generation of character-coding methods was still being discussed and some of the higher level protocols for open systems interconnection would probably be defined by then.

Implementation of the public service would be put out to international tender by the end of this year.

Despite the wait and the changes, it was still worthwhile for a company to set up a service, Griehl thought, as they would gain experience of designing and operating a system and would not have to change the applications themselves for the full public service.

Packages were already available from IBM, Philips and Siemens, he said, to handle the communications side, implementing the BT protocol with the X25 or the IBM 3270 line protocol.

Griehl's paper listed seven banks which offered or planned services, three having announced their plans in the last month. A total of 27 organisations would be linked to the gateways by the autumn, about half each using X25

and 3270. One organisation plans to offer correspondence courses from June onwards.

Peter Köhn, data processing manager of Verbaucherbank, said his bank would extend support to Bildschirmtext-based services to all towns in Germany with populations over 200,000 and would add extra facilities such as home-bank trading in stocks and shares.

The bank, he said, already allows its 40,000 customers to control their accounts via Datex-P terminals in all 11 branches, which are accessible day and night in booths opened by magnetic-card keys.

A wad of statistics provided by the bank showed that its 100 customers able to control their accounts via Bildschirmtext had accessed the system between 12 and 260 times a day.

## SOFTWARE FILE

IBM has boosted RDBMS with its query language. Software File looks at a system that uses it, and at others

## 'Truly relational' Oracle Low cost, versatility P&O's aims with Info/IBM service

IBM's endorsement of the relational approach to database management with the announcement of SQL/DS has meant a boost for those who have been using relational techniques for some time, and for one relational database in particular, Oracle.

Oracle claims to be unique in many respects, and truly relational in design. It uses IBM's access language SQL/DS with the friendlier name of Sequel 2 as its main query method.

Its developers, Relational Software Inc of Menlo Park, California describe it as the only high performance relational database management system available at the moment, and it won high praise from the US Navy DBMS tradeoff study as "an effective tool for general use."

Oracle consists of three major components. The data dictionary, which is described as being comparable with Cullinane's Integrated Data Dictionary, centrally defines all tables and data items.

Sequel 2 is billed as "a natural English-like language" which handles queries, data definition and manipulation, allowing non-programming personnel to retrieve information. A typical query is shown in Figure 1.

The third element is the Kernel of Oracle, the nucleus which deals with the physical arrangement of items and actually implements the relational method of storing data.

Using the technique of "normalisation", data structures are simplified into two-dimensional tables. "Any structure, no matter how complex, can be reduced to

two-dimensional tables by repeating some of the data," explains the Oracle manual.

Hierarchical and network databases (which were the norm before the dramatic fall in the price of hardware) become increasingly complex as the database grows. In a hierarchical database, where the data is organised in a tree structure, the links between intersecting sets of records multiply and make the structure inflexible, whereas in a relational set-up, the structure remains simple because it relies on the repetition of data items in various tables rather than pointers.

According to Relational Software, this means better performance, because the data items can be changed or enlarged, even added to, without any reorganisation of existing data or programs. Oracle's Kernel compresses data items, automatically allocates and re-uses space, optimising I/O activity buffering.

It is also multi-threaded, supporting multiple concurrent batch and online updates and queries. The Kernel overlaps I/O operations up to the limits of the hardware configuration.

At the moment Oracle runs on IBM and Digital Equipment CPUs; PDP-11/23 upwards and all VAX machines; and IBM 360/370, 303X and 4300.

The operating systems supporting Oracle are RSX-11M, IAS, Unix, VAX/VMS and VAX/Unix on Digital Equipment machines, and VM, MVS, S/VS, OS/MVT, OS/VS1, OS/MIT, DOS/VS.

```
SELECT ENAME, LOC
FROM EMP, DEPT
WHERE EMP.DEPTNO=DEPT.DEPTNO;
This query selects data from more than one table to list the names of all employees and the locations of their department. The WHERE clause identifies the common data item (DEPTNO) that allows the data in the EMP table of employees to be related or joined to the data in the DEPT department table.
```

Figure 1: Example of Sequel 2 query language, or SQL/DS as IBM calls it.

## Now everyone is getting in on the act

IBM's leap to the relational database bandwagon has been warmly welcomed by the companies which make their living from the IBM market, such as ADK, which claims to have anticipated the move with its Datacom product line.

In fact, everyone is anxious to be in on the act, and although IBM's relational database System R (in which SQL/DS is the forerunner) shows no sign of imminent arrival, there are plenty of contenders already in the market.

The best known in the UK is Logicalis, which has been noticed by several significant sales with British universities. Info is also gaining ground, with a major sales effort in the Thames Valley area, and three or four other contenders.

Other contenders supporting the relational label are soon to join the fray. Oracle-IBM's Relational Software Inc. Computer Relational, Packard 3000 mini, and the Relational Data Systems Inc.

IBM's own relational move, the SQL/DS query language, was announced in one of IBM's rare "off a great deal of work" statements of Direction and has been widely publicised.

Among those who have been quick to get in on the act is the many

salesmen are attaching the relational tag to products which don't really earn it, although they may use "relational techniques", or give the user different views of the same data.

"Without entering into technicalities, the end user expects a relational database to provide easy maintenance and expansion, and most of all an interactive query language which will be able to link data items to allow complex queries, rather in the way that Cullinane's OLQ (Online Query Language) gives a relational-like "window" on the non-relational IDMS database.

IBM's own SQL/DS seems to meet the requirements of giving "user-view" formats, data representation in tabular format, supported by a non-procedural language. Although a significant product, it is not thought to be a likely money-spinner at the monthly licensing fee of \$300, unless used as a "software sponge" to soak up micro hardware; it requires two full megabytes to run.

At the moment, SQL/DS only applies to the DOS/VS market using DLI databases, and it will not be available until February 1982. But its announcement now puts relational databases firmly within IBM's strategy, despite the fact that IBM's own relational breakthrough for larger users until the development of associative memory or content-addressable storage.

AIMING at the businessman as eventual end user, P&O Computer Services chose to offer the Info database system (billed as relational by its originator, Hence) in a bid to undercut other bureaux offering a development service such as IBM's Application System.

"It's not just a matter of being 30% cheaper, it's that we hope we will be giving a more versatile service," explained Alan Brown of P&O's marketing department. "The decision to offer Info as part of P&O's time sharing service on its remote terminal system, Ports, followed the use of the database for in-house development, including a complex personnel system to keep track of staff at sea."

New P&O is hoping to attract existing users of the IBM AS, which until now has had little competition as a desktop high-level language development system for managers. Although highly thought of, the system is expensive to use, and P&O is hoping that potential AS users in an expanding market will plump for a cheaper

alternative with the attraction of the relational tag.

Info is a database and application development which can access external files and link fields in files to provide permanent or temporary "views" of data in the relational manner. One-off reports as well as more lasting applications can be developed using Info's high-level language.

Since its release in the UK last year, Info has been running on a wide variety of equipment including Prime, but P&O is the first to offer Info as an IBM mainframe bureau service. It is being linked with the EPS evaluation and planning system as part of P&O's service.

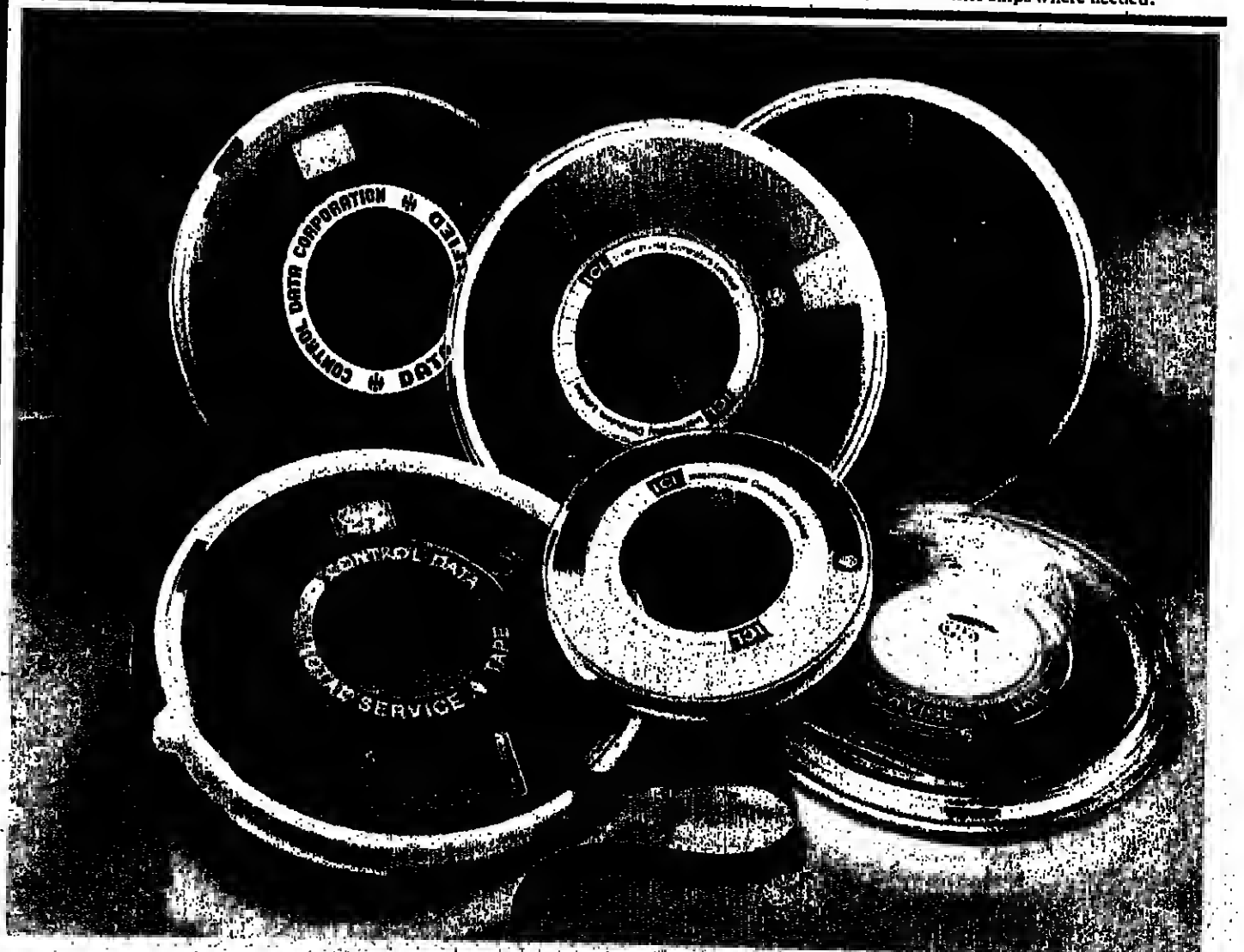
The idea is that using a terminal in his own office, with a telephone link to the P&O 370/148 and 4341 mainframes at Rickmansworth, a businessman could access, query, update and maintain records on his own files. The system and its language are not difficult to learn and it is envisaged that in some companies, as with IBM's AS, the

bureau's Info system might provide a company's sole means of data management.

P&O says that the conversion from Call VSPC, under which AS runs, has proved to be a straightforward operation. It looks unlikely that IBM will release the AS service from its present bureau basis and on those grounds P&O is hoping to attract another sort of customer: the sort who was hoping to run AS in-house eventually, and who now will be prepared to test out Info on a bureau with a view to buying the system for implementation on his own computer.

"IBM has already proved that there's a ready market so in effect AS has given us a captive audience," said Brown.

P&O's personnel department pioneered the conversion from AS to Info with its Bulk Shipping Fleet Personnel system. The system can now be accessed by non-computer personnel staff who use it to keep track of leave due to those at sea, and allocate them to other ships where needed.



## Magnetic tape from Control Dataset.

Because your major investment must deserve the major supplier.

It's no surprise that Control Dataset is the UK computer industry's leading supplier of magnetic media.

Main frame businesses know there are strong reasons for relying on Control Dataset. Such as the system drive/head/media total technology capability of Control Data Corporation. The exclusive supply of CDC and ICL label products. And the backing of Britain's biggest sales and technical support force.

CDC Alpha and Omega label and ICL label products are exclusively manufactured at Control Dataset's UK plant, allowing full control over production and simplifying delivery.

So rely on the leading brands from the major supplier. Call 0438 3388 for all your magnetic tape requirements, or write to Control Dataset Limited, P.O. Box 18, Arley Way, Stevenage, Herts. SG1 2AB.

CONTROL  
DATASET  
**CD**  
CONTROL DATA

when you need a dependable supplier, an authorised distributor with a comprehensive range of products at keen prices, backed by large stocks for fast delivery, with full after-sales support. We promise you a rapid response.

**ANADIX DP8000/8500/9000**  
Exceptional value and high reliability. 84 lines per minute, 112 cps. Parallel and serial interfaces as standard. 96 ASCII set, 9.6 baud. Variable baud rate. Full range of facilities. 1K buffer store. Options include 24 extra store IEEE interface.  
from only **£494**

**DIGITAL LA34**  
30 cps dot matrix terminal. Roll feed, paper width from 8-14 inches. EIA interface. Selectable character widths. Full 96 ASCII set, 7.5 baud. Optional features include a 20MA line driver, tracking to accept spectral feed paper and numeric keypad.  
from only **£499**

**LEAR SIEGLER 310**  
Top class, high speed terminal. Full range of facilities. 1K buffer store. Options include 24 extra store IEEE interface.  
from only **£1125**

**LEAR SIEGLER ADM-31**  
Low cost VDU with two page display and full editing features. Dual interfaces. 60-9600 baud data rates. Upper/lower case character set. Cursor addressing, editing, protected fields, dual intensity. Optional polling and addressing, printer port.  
from only **£795**

**LEAR SIEGLER ADM-42**  
Smart intelligent VDU with up to 8 pages of display. Full editing features, blinking, scrolling, cursor addressing, format, transmission, protected fields, dual intensity, separate function keys, status display. Optional alternative character set, programmable function keys, synchronous interface, line drawing set.  
from only **£1049**

**TECHTRON 850**  
Full range of facilities. 1K buffer store. Options include 24 extra store IEEE interface.  
from only **£799**

**TELETYPE 45**  
Versatile, high speed terminal. Full range of facilities. 1K buffer store. Options include 24 extra store IEEE interface.  
from only **£850**

**GRAPHICS TERMINAL**  
A low cost, high speed terminal. Full range of facilities. 1K buffer store. Options include 24 extra store IEEE interface.  
from only **£1180**

**NEW TO THE PHL RANGE**  
The Microline 80 - either parallel or RS 232-C interface plus tractor feed option. Standard parallel interface. Good discounts are available for quantity orders.  
**£330**

**PERIPHERAL HARDWARE LIMITED**  
Arncliffe Close West Molesey Surrey KT8 0EA Tel: 01-821 2126

**SOUTH**  
01-821 2126

**NORTH**  
01-821 2126

**IRELAND**  
Dub 1 952316



# To solve the problems of the book industry

by Claire Gooding

AN online system designed especially for the book publishing industry has been launched by ICL software house Systemsolve, and its client Thomson Books Ltd.

The Booksolve system, which is already installed on an ICL 2905 in TBL's distribution centre at Camberley, Surrey, copes with all aspects of the business including specialised areas such as royalties to authors, a feature which is still under development.

TBL first approached Systemsolve with the idea about three years ago, and has spent £250,000 developing the system. So that other publishers can use Booksolve, Systemsolve has developed the system in nine main application modules, which can be configured according to need.

The system has been written with the entire ICL range in mind, and runs on ME29, 2904, 2905, 2946, 2956 under DME2, as well as on the recently announced 2966.

Although the entire system costs £30,000 (including all nine elements) Systemsolve believes that it offers publishers such advantages

in terms of cash flow control and stock valuation that another three systems are likely to be sold this year alone.

Some modules adapt standard business requirements, such as sales, purchase and nominal ledgers, sales order processing and stock control, to the needs of the book-selling industry generally, and TBL in particular. In stock control, for example, there is a facility to record gratis issues of a book, and perform stock costing by title and imprint.

The specialised modules reflect the varying marketing methods used in different areas of publishing. The paperback features offered by Booksolve deal with high throughput "hype" methods used in paperback selling, and include bestseller lists, daily sales and income reports, and the monitoring of new titles and their targets.

Another module deals with the educational market and works largely through the distribution of inspection copies. It is not as time dependent as a fast-moving paperback market.



Celia Bogan, a director of United Leasing, and innovator of the company's "Art Rental for Offices" scheme, standing with the Landseer painting "An Arab Horse with Turkish Attendant".

## Celia gets her act together for a West End lease of life

by Keith Jones

THE computer leasing industry may be risky, but having survived in it successfully for more than a decade (starting at a very early age), Celia Bogan of United Leasing has extended her sphere of interest into an even more precarious line of business - theatrical production.

On a visit to New York last year Ms Bogan was bowled over by an "off-Broadway" show with the unusually long-winded title, "I'm Getting My Act Together and Taking it on the Road". In fact she loved it so much that she snapped up an option on the UK rights.

With £100,000 worth of backing from Celia, her industrialist hus-

band and about 40 other "angels", the show opens in the West End next Tuesday, March 31, at the Apollo Theatre.

It is a musical with words, all about a 39-year-old ex-cabaret singer who wants to get back into show business after fulfilling the less glamorous role of housewife and mother.

Celia admits that her first stab at theatrical production was encouraged by the provisions in the 1980 Finance Act which encourage the entrepreneur by enabling losses from a new venture to be written off against post-tax income. But with a three-year run in New York behind it and successful stagings in Los Angeles and Chicago, "I'm Getting My Act To-

gether..." could turn out to be a goldmine for Celia and her associates.

At the same time she is playing safe by retaining her post as a director and salesperson at United Leasing. This work still occupies her for nine months of the year and is not entirely tied up with the hard-nosed and cut-throat business of negotiating computer leases.

About two years ago Celia also introduced the company's "Art Rental for Offices" scheme, a bright idea but one which has not really caught on yet mainly because most firms are not terribly keen on adorning the walls of their offices with original paintings at the height of a recession.

## UK first for DG's 32-bit mini

by Keith Jones

MAIDENHEAD-based Leaso Software is the first UK organisation to install Data General's first 32-bit computer, the MV/8000.

Leasco, which has a solid base of Data General experience, will use the MV/8000 to demonstrate its commercial systems that can run on Data General equipment ranging from Nova machines upwards.

The MV/8000 will also be used for the development of other commercial and technical packages and for internal administrative requirements, including a word processing service using Data General's Az-Text software.

One of the big attractions of the MV/8000 for Leasco was its compatibility with the 16-bit Data General machines.

Part of the consulting arm of the Reliance Group, Leasco Software employs 150 professional staff.

## Evening with BCS winners

PRESENTATIONS by the three past winners of the British Computer Society Award will be made at the buffet supper meeting on April 22. The three are ICL's console addressable file store (CAFS), Research Machines' 3802 microcomputer and British Telecom's Patel.

They will be described by Mr. Moller of ICL, Mike O'Regan of Research Machines and Richard Hooper of British Telecom, who will each include an update on their reception in the market.

The meeting will be held at the Wellcome Lecture Hall of the Royal Society at 6 Carlton House Terrace, London SW1, from 7.30. Tickets are £15 including supper (£10 for BCS members) and are available from the BCS.

## MICRO NEWS

# Signetics to make M68000 - so what happens to Rockwell deal?

THE announcement last week that Signetics, with parent company Philips, is to second source Motorola's 68000 16/32 bit microprocessor and family has raised doubts about a prior agreement along similar lines between Rockwell and Motorola.

In 1979 Rockwell agreed to manufacture the 68000 and some peripheral devices, while Motorola was to manufacture Rockwell's 256K-bit bubble memory device. As yet, neither of these plans has blossomed to fruition.

The 68000, although regarded as a 16-bit microprocessor, is one of two devices around at the moment claimed to have an easy modification process to a 32-bit device. This feature becomes attractive to systems manufacturers as it makes their transition from 16 to 32-bit operations simpler, cheaper and altogether more convenient for the systems user.

However, obtaining this feature is no easy feat, and it has taken Motorola 70,000 transistors to do it. Other 16-bit microprocessors

in the market are said to use between 20,000 to 30,000 transistors, the basic elements of integrated circuits.

The other available device with this property is Zilog's Z8000 chip, second sourced by Advanced Micro Devices in Sunnyvale, California, and adopted for use in their computer systems by Olivetti and Sperry Univac.

The complexity of the M68000 design has caused some industry speculators and competitors to doubt whether it can be manufactured at all, and Rockwell admits that it has had problems. It expects to sample next month, and production quantities are due by the third quarter.

Two other 68000 second source agreements have been signed with Hitachi and the French consortium Efcis, and NCR has committed itself to using the 68000 in its future products.

Other competition exists for the 68000. National Semiconductor has recently announced its 16032 processor which is a 16-bit device

with a 32-bit internal architecture. Intel is the only company to have announced a true 32-bit microprocessor, the IAPX432, for the commercial market.

More doubt has been placed on the Rockwell/Motorola agreement by Motorola's decision to continue its own bubble memory design for a 1-megabit chip, and not to produce a lower level chip with the Rockwell design. More recently, Rockwell announced its exit from the bubble memory market altogether after an investment of about \$15 million.

Both Motorola and Rockwell deny that the agreement will be terminated. Rockwell's production delay of the 68000 has been put down to incompatibilities between the two companies' technologies.

Rockwell's future plans include the manufacture of four peripheral 68000 chips: the 68120 intelligent peripheral controller; the 68451 memory management unit; the 68450 direct memory access controller and the 68561 data communications interface device.

The first two, developed by Motorola, are expected to be produced by Rockwell later this year. The 68540, designed by Hitachi, should be available next year and the fourth device, being developed by Rockwell, is expected in late 1982.

Signetics expects to be producing 68000s from its Advanced Technology Centre in Sunnyvale by the autumn. Volume production is expected in early 1982 at a new plant in Sunnyvale. Peripherals are planned for production in a new plant in Albuquerque.

At the same time Philips plans to produce samples of the 68000 from its MOS VLSI facility in Hamburg. Both companies have a free hand to develop what they like, as long as it conforms to an agreed common architecture. Such a development could include upgrading the 68000 to a 32-bit device.

Plans to develop their own 16-bit microprocessor similar to the 68000 have been shelved by Philips and Signetics.



Two high quality printers have been released by Commodore for use with the SuperPet business system. Both are priced at under £1,000.

## Printers for SuperPet

TWO high quality printers for use with the SuperPet business system are now available from Commodore's Systems Division. Both cost under £1,000 and require no external interfacing between Pet and printer.

The 8026 letter quality printer and typewriter has interchangeable 96-character daisy wheels and can operate at a speed of 17 cps. It

has an integral keyboard for use as a typewriter with 48 characters, an erase tape allowing for up to 1400 corrections and it costs £995 plus VAT.

The 8027 is a quality letter printer, without the typewriter facility. It is a daisy wheel printer which operates at a speed of 17 cps, and is available for £850 plus VAT.

## Available next month

by Hesh Witeer

INTEL's first application for its 32-bit microprocessor is an evaluation kit called the Intellect 432/100 system which will be available in April at a US cost of \$4,250. The system will include a circuit board, evaluation software and documentation.

The three-chip set is packaged in a 64-pin chip carrier. Two of the chips make up the unit's general data processor; the instruction de-

coder unit and the micro execution unit. The third chip is an interface processor. Each chip has about 200,000 transistors.

Intel says that existing applications for the 432 include banklog transaction systems, telecommunications switching systems, PARs, online office information systems, computer aided design, multi-user business systems, factory automation, control systems and voice and pattern recognition.

## 3081 EARLY DELIVERIES

Atlantic Computer Leasing has new 3081 Computer Systems available for lease on the following confirmed IBM deliveries:-

February 1982  
April 1982  
July 1982  
December 1982

Memory sizes up to 24mb available.

Atlantic Computer Leasing Ltd.  
Atlantic House  
Red Lion Court  
London EC4A 3HN  
Tel: 01-583 9481 Telex: 268344

## Relational database for Unix

by Claire Gooding

A RELATIONAL database for use with the popular time sharing operating system Unix has been released by Relational Database Systems Inc of Sunnyvale, California. The Marathon DBMS, dealt with in this country by Keen of Nottingham, is said to contain all the power and flexibility of mainframe DBMS products yet "features a sleek design and low price".

Its facilities include a data entry language, Enter 1, used for file creation and maintenance, and a query language called Informer which is interactive and "English-like", allowing data to be viewed or written on to a scratch file for one-off inquiries.

There is also a report writer, Ace, and a data description language compiler.

A 16 system runs on Bell Laboratories Unix systems, versions 6 and 7, as well as the Onyx, Zenix and Cromix versions.

For a roundup of the relational database scene, see Software File, page 7.

## Software package success

INSTANT success for a software package allowing a Superbrain microcomputer to emulate a teletype terminal, followed a brief mention of it to Computer Weekly.

The package, called TTY, is produced by London software house Systematics. Managing director Hugh Neffendorf says an article about it several weeks ago has produced over 45 enquiries.

"Although the article was only a single paragraph, and did not include a phone number, we were amazed at the response. Over 45 organisations made enquiries, and about a quarter of these bought the program."

As of last week they included London Transport, Standard Telephones and Cables, P International, and Thorn-EMI.

TTY also permits the transfer of files to and from computers since it does not rely on control characters specific to any of them.

The package costs £180 and is available from Systematics at 112 The Strand, London WC2R 0AA. Tel: 01-836 9379.

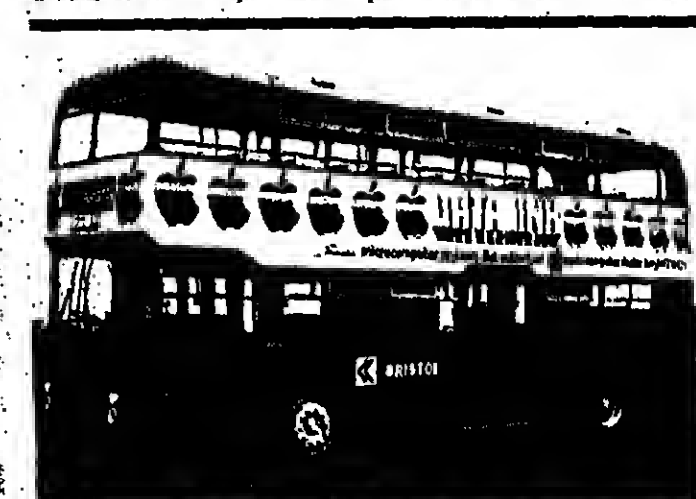
## The lowest prices in Britain?

Check our prices for  
LA34 ..... VT100  
LA120 TALLY 1612  
HAZELTINE VDU's

• OFF THE SHELF DELIVERY  
• NATIONWIDE SERVICE

MCS

112 The Strand, London WC2R 0AA  
Tel: 01-836 9379



The last gimmick in advertising Apple computers has been commissioned by Dainton Microcomputer Systems of Bristol.

## Specially for the dentist

A MICROCOMPUTER for dentists has emerged from US computer company, Computer Information Systems of Arizona. Called the System 6000, it has been designed specifically to handle dentistry.

The system comes with standard software that includes accounts payable and receivable, patient records, insurance forms, patient billing and word processing. Prices start at \$14,850.

At the same time, an investiga-

tion is being carried out to find out how technology might best be used by dentists in the UK. Consultancy company, Selcon, is being sponsored by the British Dental Association and the Department of Industry, to launch an information search.

The results, expected to be published the middle of this year, will provide a set of guidelines and recommendations on computing in dentistry, compiled from interviews with dentists who have computers, and those who do not.

## Competition in colour

THE introduction of Commodore's VIC-20 colour graphics peripheral computer, in the US has caused competition in the American market to reduce prices of their colour systems. Texas Instruments' TI-99/4A and 400, which were priced by \$300 and \$400 respectively, have been reduced to \$200 and \$300.

The VIC-20, which was released in the UK last month, is a key to the success of the Pet and similar to that of the Pet and

a special video interface integrated circuit, giving it enhanced graphics capabilities. Based on the 6502 eight-bit microprocessor from MOS Technology, it sells for \$299 in the US and probably \$400 in the UK.

Commodore claims to have a three-month backlog of orders to Japan, although there are three similar Japanese products on the market there. The company considers that if the VIC-20 sells well in Japan then Europe and the US will be "plain sailing".

## One micron dRAM from IBM

PERMANENT one micron dRAMs have been demonstrated at IBM's research centre in Yorktown Heights, New York. The fabrications are claimed to be for use in high speed, high density, and

## System that fits a briefcase

A HANDHELD computer system that fits into a briefcase has been launched into the US market by Japanese company, Matsushita. The system is similar to the Sharp PC1211 pocket computer, although it is smaller, double the price of the \$140 Sharp system.

# COMPEC EUROPE '81

CENTRE INTERNATIONAL ROGIER, BRUSSELS  
MAY 5-7, 1981

Is an important specialist exhibition for all who are interested in small computers, peripherals, terminals and microcomputers. It is ideally suited to those who are looking for immediate, low-cost solutions to their computing problems.

Sponsored by the leading publications "Computer Weekly", "Systems International", "Data Processing" and "Practical Computing" in association with the leading Dutch publication "Computable", Compec Europe has now established itself as

EUROPE'S LEADING SHOWPIECE FOR COMPUTERS, PERIPHERALS AND SOFTWARE

Entrance to the exhibition is by registration on a ticket which is \*FREE if obtained in advance or 220 BF if obtained at the door.

For your \*FREE advance tickets write to:  
Compec Europe Tickets  
IPC Exhibitions Ltd Surrey House  
1 Throby Way Sutton Surrey SM1 4QQ

\*Please note applications received after April 6 cannot be guaranteed

<b>KSR's</b> 30 cps from £46 per month 120 cps from £87 per month 240 cps from £163 per month Data Wheel from £104 per month	<b>MONICOR and VDU's</b> Standard (Teletype) compatible from £93 per month ATL from £47 per month VT52 and other options from £125 per month	<b>ASR's</b> Integral terminals from £87 per month Separate P/T Cassette units from £43 per month Separate Diskette units from £60 per month Contact Mike Brooke or Philip Ely Tel: 07333 55211	<b>MBS Rentals</b> Specialists in the renting of terminals 112 The Strand, London WC2R 0AA
--	---	---	--



Part 4 of our series on setting up a company

# How to finance that business venture without taking a loan

IN the last article we broadly distinguished between loans, which require regular capital and interest repayments, and which can seriously handicap the growth of a small computer company by loading the cash flow with negative payments before positive income arises, and equity capital, which has none of those effects.

Equity, in its simplest terms, is a non-revocable loan at interest rates which the company itself can determine.

Equity, while giving a company relief from payments which may become onerous to the point of failure at times, also gives a company the opportunity to relate its performance directly to the reward its shareholders expect. The general return for good performance is a further opportunity to raise equity capital, and where a company is quoted on a stock exchange, to sell equity at a profit. For instance, at least one American computer company was reputed to have spent several years making more money from selling its shares than it did from marketing its products.

In the computer financing field there are three traditional main suppliers of mixed equity and loan funding capital. They are the National Research and Development Corp, the Industrial and Commercial Finance Corp, and the National Enterprise Board.

The NRD has a strong reputation for funding basic research, though its balance sheet shows a loss towards university-type projects. Lately the corporation has been paying a large volume of tax, which suggests it is not investing as resolutely as it used to.

The ICFC has a long and distinguished history, with some involvement in almost every big computer company in the UK.

The National Enterprise Board, while best known for its post or pre-merger involvement with companies like ICL, Ferranti and Plessey, has also made a series of significant investments in much smaller

companies, such as Leeds-based Systime.

If you decide that you would like to look at other sources of equity funds, however, there are three new and not directly related services which have emerged.

First there is the computer-oriented broker. A good example is Brian Mills, ex-managing director of BOC Datasolve, who is among the best-known figures to enter this field recently (see adjoining article).

Then there is capital funding from banks, an example of which was recently set up by Citibank with £12.5 million to invest. This scheme is administered by a central team, heavily biased towards computer companies.

John Littlechild, one of the investment officers concerned, explains that the scheme is intended to get money into the early stages of a company's growth, rather than provide set-up funds. He stresses that a company should have a product and at least a few customers, before approaching Citibank.

The fund has been running in the US for 10 to 15 years and numbers Datapoint, Storage Technology and Applicon among its successes.

Littlechild stresses that Citibank recognises that many computer companies require long-term funding for profitable growth. "We are not an in and out organisation," he says. "Once we are in, we stick with our clients."

Citibank emphasises that it is investing in the management of a company and looks for a coherent and experienced team to lead the project. The initial presentation to it will be the potential borrower's business plan, and Citibank would look for the following points:

- The management team;
- Plans of what the company is going to do;
- Details of products;
- What the manufacturing programme is;
- What R&D is planned;

• Good knowledge of basic markets;

• Details of existing customers;

• Cash flow statement.

The minimum stake Citibank would take is about £200,000. There is no upper ceiling and Citibank often syndicates with like-minded investors to spread the risk and increase the funds available.

For those who prefer to seek a more anglicised source of funds, a number of stockbroking companies are beginning to specialise in organising equity for new computer companies.

One of these is Greene and Co, whose statistics frequently appear in these pages.

Another company, which has six offices straddling what may well become one of the UK's Silicon Valleys down in rural Berkshire, is Heseltine Moss and Co.

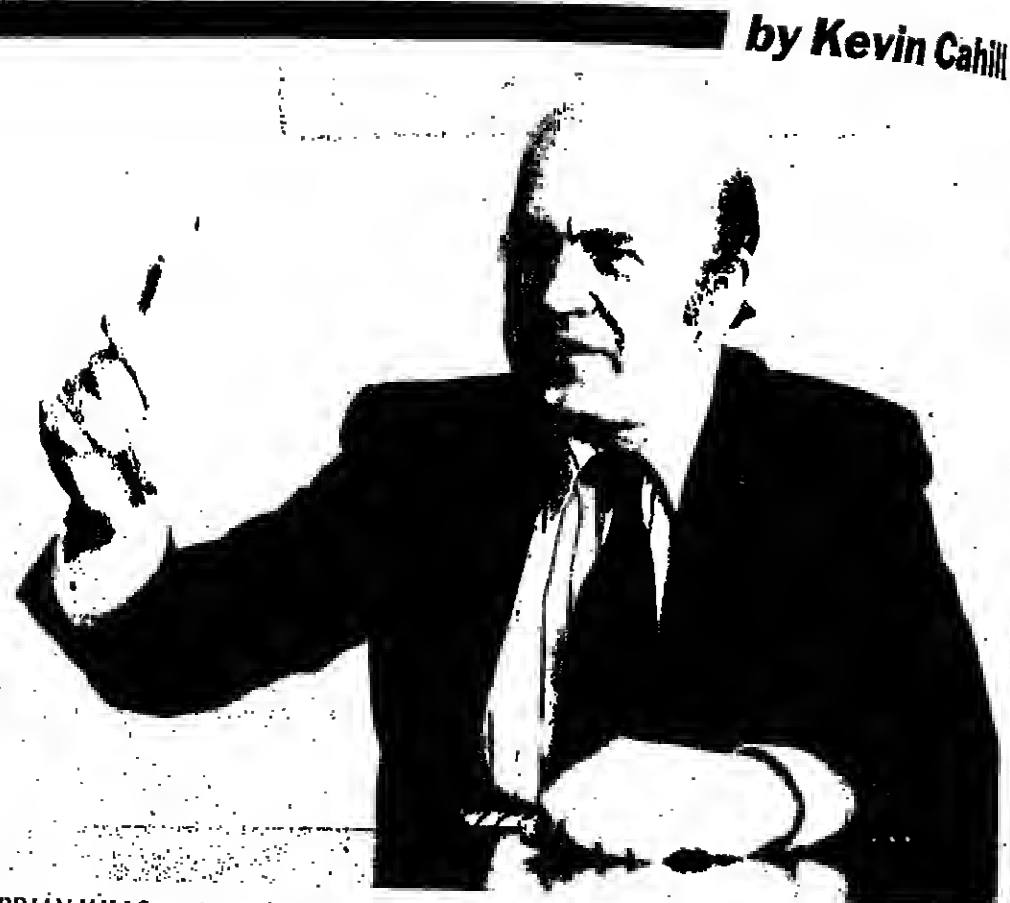
Martin Ingram is the research partner in its London office, and he explained why many computer companies might find a stockbroker a congenial and effective partner.

"Over the years, Heseltine Moss has built up a portfolio of private and institutional investors in the UK. We know the clients intimately, and can usually arrange the most compatible match of investor and recipient. Frequently we can arrange local participation in a company which will add to a company's marketing and other contacts."

"Where a board appointment is agreed we can arrange that the match, as well as providing the investor with a point of contact with his investment, will also provide the recipient with a stockbroker."

"By starting with a stockbroker, a small company begins the logical preparation for a stock market quotation."

In the next article in this series, we will look at how a computer company might get a stock market listing, and at the experience of some computer companies which are quoted on the London Stock Exchange.



BRIAN MILLS... A variety of ways to help small computer companies.

## Ex-BOC man's consultancy aims to satisfy a 'huge need'

BRIAN MILLS, former chief executive of BOC Datasolve, and one of the best known names in the UK computer industry over the past 20 years, has got together with Stanford trained David Ferris to form a new computer-oriented finance consultancy called Ferris Mills & Associates.

The pair, who between them must have over 30 years' experience in the data processing industry, feel that there is a huge need for the kind of service they offer.

Mills says there are a variety of ways in which they could help small computer companies, principally by finding loan and venture or equity capital from their many contacts in UK and US financial circles.

He said he acted as adviser to both borrowers and investors, depending on the requirement.

At the moment in the UK there is a strong two-way interest in small companies, noted Mills.

In fact John Evans, investment manager of the Industrial and Commercial Finance Corp, was recently quoted as saying, "There is

so much money chasing so few companies."

At least part of this "money" would use people like Ferris and Mills to guide them to the right kind of computer companies in which to invest.

Mills stresses the need to begin the relationship well ahead of a request for funding. It is difficult in most financial matters if the parties don't know each other prior to the request he says, so the best approach is to "get to know companies like ours before a specific need arises." He cited ICL-CPD as a recent case where he and Ferris were invited to find a partner for the company, but failed because of the very short time span involved.

A really good match between a computer company and a sound and suitable financial partner cannot be made overnight, Mills said.

In most cases neither the investor nor the company want all their eggs in one basket.

Both Ferris and Mills stressed the need for a really good business plan when a company is looking

for finance for new ventures and expansion. Even a good company can lose potentially sound loans if the presentation, what UK brokers would call the "package", is poor.

Ferris stressed that a plan did not need to be either long or complicated.

Ferris, who has acted as a marketing consultant to ICL and Intel in the US, said that the most available for investment to which they had access ranged from unquoted £1 billion, trusts down to small private clients putting up £70,000.

### All systems go

ONE OF the largest independent disc suppliers, System Industries, has announced a new turnover and profit high for the year ending December, with revenues at \$3.3 million (\$25 million for 1979) and post-tax profits of \$1.9 million, excluding \$516,000 tax credit, from what the company describes as "discontinued operations".

## UK systems house moves into Dallas

by Keith Jones

OIL-RICH Dallas is the location selected by UK systems and software house, Computer Systems International, for its second office in the US.

CSI managing director Peter Hunter said Dallas was chosen because it was seen as one place unaffected by the recession.

He added that there were now no expansion plans for the UK.

CSI's operations in the US started in 1971 and led to a full subsidiary company, Computer Systems Development Inc, being set up in New York in 1976. Areas of activity have included database implementation for banks, insurance companies and stockbrokers, and message switching network development for members of the banking community.

Hunter said the main customers in Dallas would be oil companies,

and the work of a general commercial nature. It would not be "technologically exciting". The whole aim was simply to expand the company's business.

Measures to achieve this have also included the recruitment of 18 additional computer professionals in the UK to work for the US company.

There are three companies in the CSI group, the other being the IBM-based bureau Computer and Accounting Services. All three are owned by the unquoted UK holding company, Lopex, a major force in the advertising and market research business with a turnover of about £90 million a year.

The CSI group chalked up pre-tax profits of £157,000 in 1980 on a £1.7 million turnover. The US side contributed about \$150,000 to the profit figure and \$1.5 million to turnover.

## Profits doubled at Cullinane

TURNOVER and net profit up 65% and 110% respectively, have been announced for the third quarter ended January 1981 of its current fiscal year by Cullinane Database Systems Inc, the firm that used to be called Cullinane Corp. The actual figures were \$7,715,000 and \$1,355,000.

Cullinane attributes £300,000 or

46% of the net profit increase to the interest earned from the investment in marketable securities of the proceeds of a public offering.

Turnover and net profit figures for the nine-month period were \$20,629,000 and \$3,043,000, respectively, well up on the \$12,738,000 and \$1,708,000 of January 1980.

### MSA share price

THE share price of Management Science America, which announced its intention to go public last week, is likely to be between \$13 and \$16. The initial offering consists of a primary 950,000 shares followed by a secondary offering of 550,000, which will bring MSA between \$19.5-\$24 million and leave outstanding 5,165,496 common shares.

### Public offer

MURIPHIERAL and multiplexer manufacturer Emulux has filed a registration statement with the US Securities and Exchange Commission to make an initial public offering of its common stock. The 742,869 common shares, 425,713 from the company and the rest from shareholders, will be sold to raise money for capital assets and repayment of bank loans.

## CW SHARES TABLE

Date 26/3/81		Index 100 = 234		US Stocks			
Price		Change		Price		Change	
1981		1981		1981		1981	
High	Low	High	Low	High	Low	High	Low
142	118	143	8	143	8	143	8
141	117	142	9	142	9	142	9
140	116	141	10	141	10	141	10
139	115	140	11	140	11	140	11
138	114	139	12	139	12	139	12
137	113	138	13	138	13	138	13
136	112	137	14	137	14	137	14
135	111	136	15	136	15	136	15
134	110	135	16	135	16	135	16
133	109	134	17	134	17	134	17
132	108	133	18	133	18	133	18
131	107	132	19	132	19	132	19
130	106	131	20	131	20	131	20
129	105	130	21	130	21	130	21
128	104	129	22	129	22	129	22
127	103	128	23	128	23	128	23
126	102	127	24	127	24	127	24
125	101	126	25	126	25	126	25
124	100	125	26	125	26	125	26
123	99	124	27	124	27	124	27
122	98	123	28	123	28	123	28
121	97	122	29	122	29	122	29
120	96	121	30	121	30	121	30
119	95	120	31	120	31	120	31
118	94	119	32	119	32	119	32
117	93	118	33	118	33	118	33
116	92	117	34	117	34	117	34
115	91	116	35	116	35	116	35
114	90	115	36	115	36	115	36
113	89	114	37	114	37	114	37
112	88	113	38	113	38	113	38
111	87	112	39	112	39	112	39
110	86	111	40	111	40	111	40
109	85	110	41	110	41	110	41
108	84	109	42	109	42	109	42
107	83	108	43	108	43	108	43
106	82	107	44	107	44	107	44
105	81	106	45	106	45	106	45
104	80	105	46	105	46	105	46
103	79	104	47	104	47	104	47
102	78	103	48	103	48	103	48
101	77	102	49	102	49	102	49
100	76	101	50	101	50	101	50
99	75	100	51	100	51	100	51
98	74	99	52	99	52	99	52
97	73	98	53	98	53	98	53
96	72	97	54	97	54	97	54
95	71	96	55	96	55	96	55
94	70	95	56	95	56	95	56
93	69	94	57	94	57	94	57
92	68	93	58	93	58	93	58
91	67	92	59	92	59	92	59
90	66	91	60	91	60	91	60
89	65	90	61	90	61	90	61
88	64	89	62	89	62	89	62
87	63	88	63	88	63	88	63
86	62	87	64	87	64	87	64
85	61	86	65	86	65	86	65
84	60	85	66	85	66	85	66
83	59	84	67	84	67	84	67
82	58	83	68	83	68	83	68
81	57	82	69	82	69	82	69
80	56	81	70	81	70	81	70
79	55	80	71	80	71	80	71
78	54	79	72	79	72	79	72
77	53	78	73	78	73	78	73
76	52	77	74	77	74	77	74
75	51	76	75	76	75	76	75
74	50	75	76	75	76	75	76
73	49	74	77	74	77	74	77
72	48	73	78	73	78	73	78
71	47	72	79	72	79	72	79
70	46	71	80	71	80	71	80
69	45	70	81	70	81	70	81
68	44	69	82	69	82	69	82
67	43	68	83	68	83	68	83
66	42	67	84	67	84	67	84
65	41	66	85	66	85	66	85
64	40	65	86	65	86	65	86
63	39	64	87	64	87	64	87
62	38	63	88	63	88	63	88
61	37	62	89	62	89	62	89
60	36	61	90	61	90	61	90
59	35	60	91	60	91	60	91
58	34	59	92	59	92	59	92
57	33	58	93	58	93	58	93
56	32	57	94	57	94	57	94
55	31	56	95	56	95	56	95
54	30	55	96	55	96	55	96
53	29	54	97	54	97	54	97
52	28	53	98	53	98	53	98
51	27	52	99	52	99	52	99
50	26	51	100	51	100	51	100
49	25	50	101	50	101	50	101
48	24	49	102	49	102	49	102
47	23	48	103	48	103	48	103
46	22	47	104	47	104	47	104
45	21	46	105	46	105	46	105
44	20	45	106	45	106	45	106
43	19	44	107	44	107	44	107
42	18	43	108	43	108	43	108
41	17	42	109	42	109	42	109
40	16	41	110	41	110	41	110
39	15	40	111	40	111	40	111
38	14	39	112	39	112	39	112
37	13	38	113	38	113	38	113
36	12	37	114	37	114	37	114
35	11	36	115	36	115	36	115
34	10	35	116	35	116	35	116
33	9	34	117	34	117	34	117
32	8	33	118	33	118	33	118
31	7	32	119	32	119	32	119
30	6	31	120	31	120	31	120
29	5	30	121	30	121	30	121
28	4	29	122	29	122	29	122
27	3	28	123	28	123	28	123
26	2	27	124	27	124	27	124
25	1	26	125	26	125	26	125
24	0	25	126	25	126	25	126
23	-1	24	127	24	127	24	127
22	-2	23	128	23	128	23	128
21	-3	22	129	22	129	22	129
20	-4	21	130	21	130	21	130
19	-5	20	131	20	131	20	131
18	-6	19	132	19	132	19	132
17	-7	18	133	18	133	18	133
16	-8	17	134	17	134	17	134
15	-9	16	135	16	135	16	135
14	-10	15	136	15	136	15	136
13	-11	14	137	14	137	14	137
12	-12	13	138	13	138	13	138
11	-13	12	139	12	139	12	139
10	-14	11	140	11	140	11	140
9	-15	10	141	10	141	10	141
8	-16	9	142	9	142	9	142
7	-17	8	143	8	143	8	143
6	-18	7	144	7	144	7	144
5	-19	6	145	6	145	6	145
4	-20	5	146	5	146	5	146
3	-21	4	147	4	147	4	147
2	-22	3	148	3	148	3	148
1	-23	2	149	2	149	2	149
0	-24	1	150	1	150	1	150
-1	-25	0	151	0	151	0	151
-2	-26	-1	152	-1	152	-1	152
-3	-27	-2	153	-2	153	-2	153
-4	-28	-3	154	-3	154	-3	154
-5	-29	-4	155	-4	155	-4	155
-6	-30	-5	156	-5	156	-5	156
-7	-31	-6	157	-6	157	-6	157
-8	-32	-7	158	-7	158	-7	158
-9	-33	-8	159	-8	159	-8	159
-10	-34	-9	160	-9	160	-9	160
-11	-35	-10	161	-10	161	-10	161
-12	-36	-11	162	-11	162	-11	162
-13	-37	-12	163	-12	163	-12	163
-14	-38	-13	164	-13	164	-13	164
-15	-39	-14	165	-14	165	-14	165
-16	-40	-15	166	-15	166	-15	166
-17	-41	-16	167	-16	167	-16	167
-18	-42	-17	168	-17	168	-17	168
-19	-43	-18	169	-18	169	-18	169
-20	-44	-19	170	-19	170	-19	170
-21	-45	-20	171	-20	171	-20	171
-22	-46	-21	172	-21	172	-21	172
-23	-47	-22	173	-22	173	-22	173
-24	-48	-23	174	-23	174	-23	174
-25	-49	-24	175	-24	175	-24	175
-26	-50	-25	176	-25	176	-25	176
-27	-51	-26	177	-26	177	-26	177
-28	-52	-27	178	-27	178	-27	178
-29	-53	-28	179	-28	179	-28	179
-30	-54	-29	180	-29	180	-29	180
-31	-55	-30	181	-30	181	-30	181
-32	-56	-31	182	-31	182	-31	182
-33	-57	-32	183	-32	183	-32	183
-34	-58	-33	184	-33	184	-33	184
-35	-59	-34	185	-34	185	-34	185
-36	-60	-35	186	-35	186	-35	186
-37	-61	-36	187	-36	187	-36	187
-38	-62	-37	188	-37	188	-37	188
-39	-63	-38	189	-38	189	-38	189
-40	-64	-39	190	-39	190	-39	190
-41	-65	-40	191	-40	191	-40	191
-42	-66	-41	192	-41	192	-41	192
-43	-67	-42	193	-42	193	-42	193
-44	-68	-43	194	-43	194	-43	194
-45	-69	-44	195	-44	195	-44	195
-46	-70	-45	196	-45	196	-45	196
-47	-71	-46	197	-46	197	-46	197
-48	-72	-47	198	-47	198	-47	198
-49	-73	-48	199	-48	199	-48	199
-50	-74	-49	200	-49	200	-49	200
-51	-75	-50	201	-50	201	-50	201
-52	-76	-51	202	-51	202	-51	202
-53	-77	-52	203	-52	203	-52	203
-54	-78	-53					









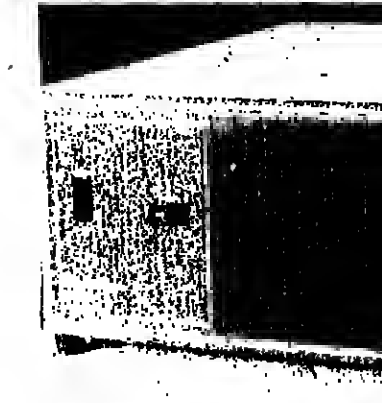






# A package to speed up floppy disc output

A PERFORMANCE enhancement package said to speed up floppy disc output by three to five times and boost storage efficiency by 30 per cent, is available for the Equinox Series 5000 and 8000 microsystems.



Equinox's Turbocharger is designed for the 5000 and 8000 microsystems.

It also allows the disc operating system to configure dynamically for the amount of RAM installed, and RAM errors are diagnosed automatically on start-up.

The Turbocharger speed advantage is achieved by multi-level buffering of disc I/O, using least-recently-used (LRU) buffer assignment and other optimisations. This should provide a multifold reduction in the number of physical disc accesses.

Disc capacity is increased by using larger physical sector sizes. For example, an ordinary 8-inch single-sided, single-density disc can accommodate eight 512-byte sectors per track compared with the more common format of 26 128-byte sectors per track.

Additional capacity is accomplished by eliminating reserved "system tracks" required by standard CP/M, the result being a 306-K-byte capacity on a single-sided, single-density disc compared with 241K for standard CP/M.

For double-sided and double-density recording, the Turbocharger permits more than 1.25MB on 8-inch discs and 400K on 5-inch discs.

The Turbocharger is optional on the Equinox Series 5000 and 8000 microsystems and costs £150 plus VAT.

Equinox Computer Systems Ltd (CW), Klemm House, 16 Anning Street, New Inn Yard, London EC2A 3HB. Tel: 01-729 4460.



Terminal Display Systems' 6212 high performance colour graphics terminal.

# Graphics for all seasons

THE 6212 high performance colour graphics terminal is the latest addition to the Ramtek 600 family available from Terminal Display Systems of Blackburn.

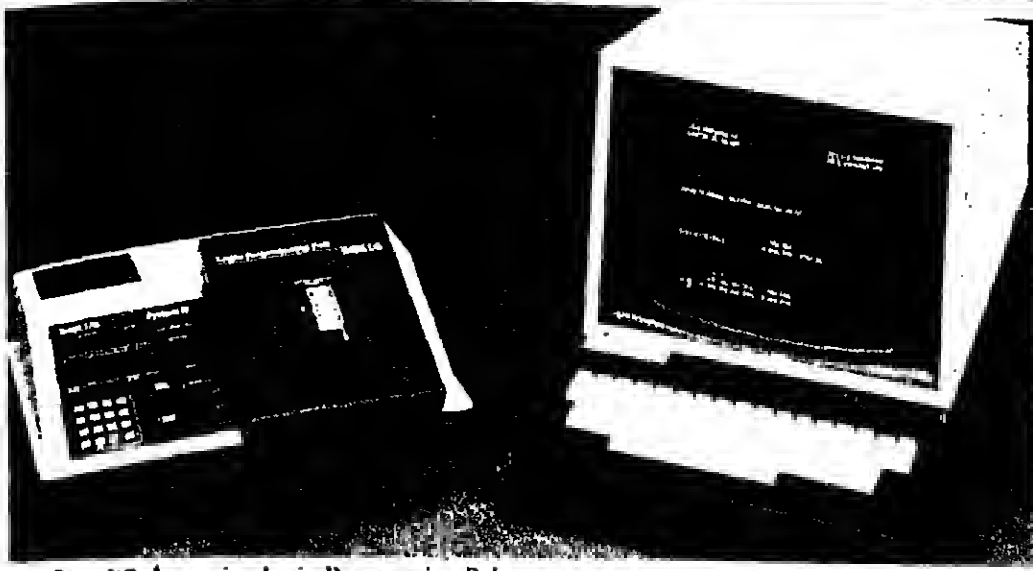
This terminal is said to have a wide range of applications including business graphics, accounting, control, management information systems and command console displays.

With a 640 x 512 resolution, the 6212 should provide high definition display and users whose graphics have high vector content will need the optional hardware vector generator, designed to meet rigorous drawing requirements.

By writing vectors at 0.8 micro seconds per pixel the generator should give a high level serial performance comparable with DMA parallel driven systems.

The serial RS232 interface will operate at speeds up to 19.2K baud.

Terminal Display Systems (CW), Phillips Road, Whiteley Estate, Blackburn BB1 5TH. Tel: 0254 676921.



The Data I/O Interactive Logic Programming Pak.

# Pak speeds FPLA programming

AN Interactive Logic Programming Pak for Data I/O's System 19 PROM and Logic Device Programmer, has been designed to speed the programming of Signetics FPLAs, based on Signetics 28-pin Integrated Fuse Logic (IFL).

In principle, bi-polar logic devices are programmed using the same fuse-link techniques applied to the programming of PROMs. The process involves the selective blowing of fuses to produce the desired pattern. However, with a logic device, it can be difficult to know which fuses to blow.

Normally, the desired output levels are defined by producing specified input combinations, then representing these functions in a State Table. Once the logic functions are defined, information must be translated into a form in which each bit represents a device

fuse. This is usually done on the manufacturer's logic diagram. The Interactive Logic Programming Pak contains software that does all the translation automatically. Equations are entered by VDU. It removes manual translation and speeds programming.

Microsystem Services (CW), 11 Duke Street, High Wycombe, Bucks HP13 6EE. Tel: (0494) 41661.

# Intelligent terminal has wide range of uses

AN INTELLIGENT terminal from Data General offers OEMs and end-users MicroNova computer power for a wide range of applications.

Model 5100 is available from the Special Systems group and can be used as a stand-alone MicroNova system or cluster controller. It can also be used as a remote intelligent subsystem with downline loading, local disc or diskette storage.

It uses a MicroNova MP/100 backplane, permitting the use of MP/100 peripherals and interfaces, including diskettes, discs and communications options.

There are nine 5100 models, separated into two basic 5100B and 5100M versions, the 5100B based on the MicroNova Board Computer (MBC) line with four expansion slots, while the 5100M is based on the MP/100 microcomputer with three expansion slots.

Hardware and software are designed into an integrated package with the Dasher 6093 video display terminal used as a system console for the Micro Nova computer.

Small business systems based on the 5100B and 5100M can handle an impressive workload when assisted by options such as peripheral memory, disc, diskette, or mag tape, terminal printers and line printers.

Communications options include asynchronous and synchronous line interfaces, multiplexors, CRC generation and checking and 801C auto call interface. The communications hardware is complemented by RJE-80, HASP II and X.25 software.

The 5100 display has a 12-inch screen (80 columns by 24 lines) and features direct cursor positioning and screen sensing.

Prices range from £3,125 and delivery is 90-120 days after receipt or order.

Data General (CW), Hounslow House, 724-734 London Road, Hounslow, Middlesex TW3 1PD. Tel: 01-572 7455.

Two products have been added to Hardware House's range. New to its word processing range is Quill 1. This combines all the features of the Solitaire/MP word processor with the large character, bar code and bar chart capabilities of the programmable printing machine.

Quill can be installed for stand-alone labelling applications. The word processing software provides editing, storage and retrieval facilities, with draft printing of up to 300 lines per minute.

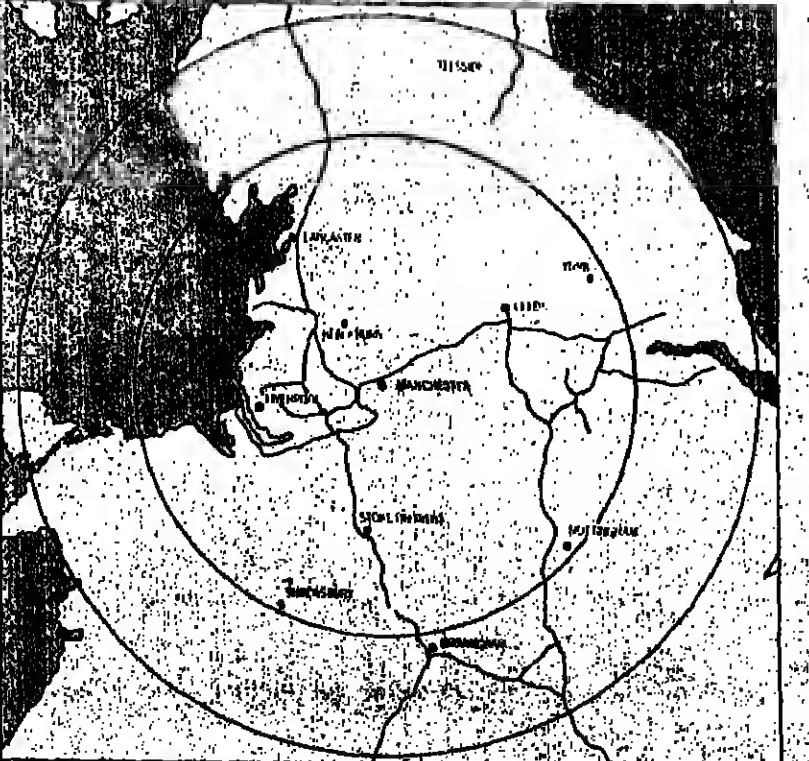
The Solitaire business system is also available, which uses a Basic language dialect known as Micro Business Basic.

A range of applications software packages are available to systems builders for use as seed software for their customers' own applications.

Hardware House (CW), Church Road, Burgess Hill, Sussex. Tel: (0444) 2519.

# Hardware House launches

Computer Weekly brings you  
**COMPEC NORTH'81**  
Belle Vue, Manchester  
June 23-25, 1981



**For better communication with the heart of industrial Britain**

The sponsors and organisers of COMPEC are proud to present the first extension but - the largest, most comprehensive and most visited computer show in Britain. For details, send the coupon NOW.

**COMPEC NORTH'81**

To: Compec North, c/o IPC Exhibitions Ltd, Surrey House, 1, Throby Way, Sutton, Surrey, SM1 4QQ. Please send me more information about exhibiting at COMPEC NORTH.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_

# Sophisticated filters for sensitive uses

TYPEFR 64 and FR 114 mains RFI filters from Schaffner are designed to protect sensitive electronic equipment and systems from mains-borne interference produced by such phenomena as switching surges, circuit breakers and thyristor-controlled equipment.

These multi-stage filters, incorporating an earth return choke to block interferences entering over the earth lead, are effective in metal housings and screened over the 150kHz-300MHz frequency range.

Rated at three amperes, the TYPEFR 64 is provided with one 13A socket outlet while the FR 114 is rated at 6A with two parallel outlets. A miniature automatic circuit breaker with luminous on/off switch should ensure both safety and ease of use.

The FR 64 and 114 filters have high attenuation of 80 dB and appear suitable for a wide range of applications, ensuring a clean power supply to computers, instruments and laboratory, office and educational equipment.

They can also be used to suppress interference from sources such as electric typewriters, telex machines, test circuits such as thyristor circuits and prevent such interference from reaching the mains supply.

Available from Schaffner's UK distributors Lyons Instruments, the current 1-9 prices (ex VAT) are £48 and £65 respectively for the FR 64 and FR 114, with price reductions for 10 or more.

Lyons Instruments (CW), Huddesdon, Herts. Tel: 0994 67161.



The TYPEFR 114.

# Versatile tape prep system launched

TELEPRINTER Equipment Ltd has marketed the versatile NC-1000 integrated CNC tape preparation system in the UK, employing both EIA and ISO codes and capable of interface on parallel, RS 232C and current loop devices.

It can be used with most machine tool control CPU or time-sharing systems. TEL maintains that the NC-1000 is a three to seven times faster than a TTY-based time share system and will result in lower line charges.

The assembly comprises three interlinked devices: the DEC LA34 keyboard terminal; NC-1

microprocessor-based code converter module and the NC-300 paper tape reader/punch.

As it is capable of receiving EIA and ISO codes and converting them into the other, NC-1000 can be used with machines using both tape formats.

Editing capabilities permit searching block by block, rewording or editing existing programs and/or the creation of new formations.

Teleprinter Equipment Ltd (CW), Alkman Street, Tynes, Herts. HP23 6AJ. Tel: 0494 401179 and 555119.

# Rair text quality printer

RAIR announces the addition of the Diablo Model 630 text quality printer to its advanced terminal products catalogue as listed in the line of daisy-wheel printers throughout features of the well-established Hytrem range but at reduced cost.

The Model 630 incorporates a new version of the Hytrem mechanism improved to allow both dot and metal print wheels to be used on the same printer.

Rair Ltd (CW), 20-32, St. Giles Street, London WC2H 9PS. Tel: 01-834 4663.

# Silencer for printer

THE LATEST acoustic enclosure silencer from Power Equipment is designed to reduce the noise output of the recently introduced Centronics 737 dot matrix printer.

Up to 80% noise reduction is claimed for the enclosure and the unit is designed to allow easy operator access to the machine, accommodating three-way letterhead, fanfold and roll paper handling facilities.

The silencer consists basically of a compact, specially finished metal casing with hinged transparent acrylic front and top section for viewing and access.

High density acoustic foam is bonded to interior surfaces, which absorbs noise and dampens out vibration. The lid panel lifts for access to the power switch, online/local switch and paper feed controls.

Installation may be accomplished within five minutes, and the bottom section of the enclosure, a heavy gauge steel tray covered in dense foam, is placed below the printer.

The main casing is placed over the machine and located on the base tray. Slots are cut in the casing for power and signal leads so that the printer may remain operational during fitting.

A small whisper quiet fan is fitted as standard, designed to maintain internal temperature within the printer's operating range and an optional matt black tubular metal stand is available.

The Power Equipment Co (CW), Kingsbury Works, Kingsbury Road, London, NW9 8DU. Tel: 01-205 0038.

# Encoder for plastic cards

NATIONAL Business Systems of Canada has introduced the NBS Model 500 encoder, designed to provide automatic error-detection.

The machine has a VDU and matrix printer built in as standard and a motor-driven read/write mechanism whose constant speed and precise registration are said to ensure accurate entry and data read-back.

The Model 500 is a stand-alone, desktop machine designed to encode and read all three standard ISO magnetic stripes on plastic credit and cash-dispensing cards, or on similar cards used for security or job-processing purposes.

It will simultaneously complete data from all three tracks on the 5-inch diagonal (130mm) VDU screen. Print-out on demand gives an immediate hard-copy record of encoded information and the machine can be programmed to accept special data formats; it may also be linked to an embosser or a mainframe computer.

Controls comprise a standard typewriter keyboard with additional control-keys, plus ten separate single-function keys and LED indicators show the machine's status at any moment.

NBS Division of Lanyard Ltd (CW), 214 Station Road, Addlestone, Weybridge, Surrey KT15 2PH, England. Tel: Weybridge 53291.

# Software for Superbrain

THE Business Desk software package, developed and marketed by Perot Computers, is available for smaller disc capacity microcomputers.

Perot claims the Business Desk implementation on a two-drive quad density Superbrain to have capacity in line with the requirements of the typical small business.

The software is written in C18 Cobol, is suitable for implementation on any CP/M based microcomputer, and costs £2,400.

Perot Computers (CW), 26 New Street, St Neots, Huntingdon, Cambridgeshire. Tel: 0455 214765.

# Privacy for Telex users

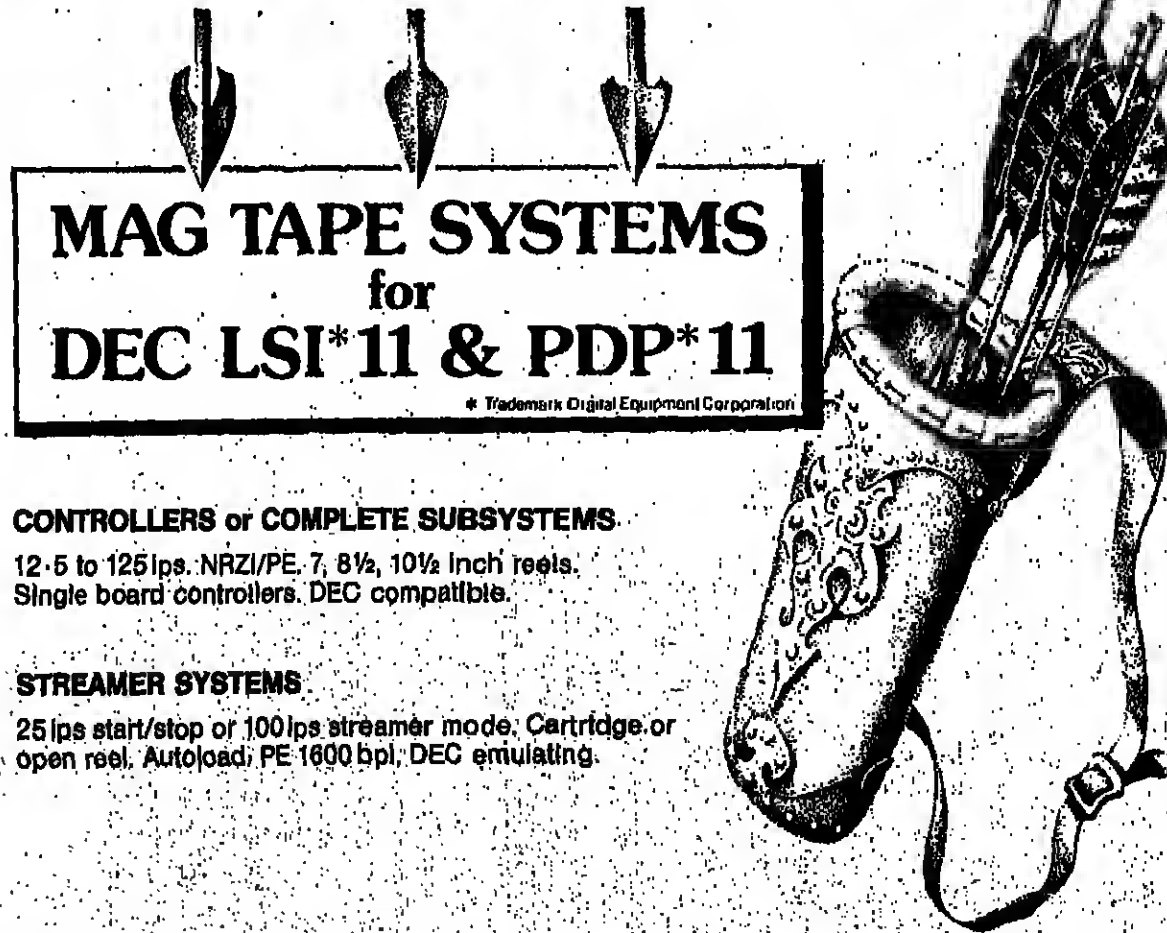
MERCK and Hollander of Pangbourne, has launched an encryption terminal for Telex users with full screen-edit facilities.

Designated HI-TEK System 2800 the equipment provides a method of preparing private (encrypted) Telex tapes in privacy with the advantage that the equipment can also produce screen-edited standard telex tapes.

Telex messages can be prepared in the executive office and sent to encrypted form for transmission.

Merck and Hollander Ltd (CW), 11 Reading Road, Pangbourne, Berks RG8 7LR. Tel: 07357 2151.

# SYSTEM BUILDING OPTIONS MEAN MORE POINTS IN YOUR FAVOUR



**MAG TAPE SYSTEMS**  
for  
**DEC LSI\* 11 & PDP\* 11**

**CONTROLLERS or COMPLETE SUBSYSTEMS.**  
12.5 to 125 ips. NRZI/PE. 7, 8 1/2, 10 1/2 inch reels.  
Single board controllers. DEC compatible.

**STREAMER SYSTEMS**  
25 ips start/stop or 100 ips streamer mode. Cartridge or open reel. Autoload. PE 1600 bpi. DEC emulating.

- ALSO AVAILABLE: Disc Systems. Winchester. SMD. Cartridge. All totally DEC compatible.
- DEC LSI/11 or PDP11 compatible.
  - Single board controllers.
  - Low cost.
  - Fast delivery.

**ARROW COMPUTER SYSTEMS LIMITED**  
Rosemount Tower, Stafford Road, Wallington, Surrey SM6 8RW.  
Telephone: 01-847 0862. Telex: 262469.















# Appointments

THE NEWSPAPER COMPUTER PEOPLE RELY ON

# Appointments

**Computer Weekly**

Classified Department, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Box Numbers: Should be addressed to the box number in the advertisement c/o Computer Weekly at the above address.

Classified Rates: £10 per sec.  
19 x 3 cols £162. 39 x 3 cols £1,470  
Full Page (19 x 7 cols) £1,530  
19 x 4 cols £1,712  
Full Page (19 x 7 cols) £2,900

Copy Deadline: 3.30 pm Monday prior to publication date. Complete artwork up to 11 am Tuesday. Advance payment reservation is advisable.

LONDON 01-661 0121 (5 lines)  
Chris Prior: Assistant Classified Supervisor  
Neil McDonnell: Classified Supervisor  
Jan Faux: Consultancies  
Julie Hannaford: Consultancies  
Unwinn Smith: General Appointments  
Gillian Johnson: General Appointments  
Kevin McEwan: General Appointments  
Peter Regis: General Appointments

MANCHESTER/GLASGOW  
Owen Kelly 061-872 8861  
Gillian Allen 061-872 8861

BIRMINGHAM/BRISTOL  
Vic Shieret 021-356 4836

Classified Production 01-661 3600 Ext. 3104 Steve Lever

**MYRIAD**

COMPUTER WEEKLY, March 26, 1981

27

## ★ 18 MONTHS' TO 3 YEARS' POST-GRAD EXPERIENCE? ★

## ★ WONDERING WHERE TO GO NEXT? ★

## ★ COMMUNICATIONS — LOCAL NETWORKS DEVELOPMENT ★

**£7000-£8500 + REVIEW**

**BERKSHIRE**

If you have a good degree (Upper Second or better) preferably in Computer Science, Electronic Engineering or Physics and have subsequently gained 1½ to 3 years' experience of REAL-TIME SOFTWARE development using a minicomputer or microprocessor Assembler, preferably PDP11 or Zilog/Intel, our client can offer you an outstanding opportunity to become involved in the development of an exciting range of products including LOCAL AREA DATA NETWORKS; one of the most demanding and fastest-growing areas of computing today.

The company is a member of one of Britain's most successful organisations. It is expanding rapidly both in the U.K. and overseas, despite the recession, and is the acknowledged market leader in its field. In order to retain and enhance this lead it is committed to extensive ongoing systems product development and now wishes to appoint several additional SYSTEMS PROGRAMMERS. Comprehensive training in all aspects of data communications and microprocessor application will be provided.

Excellent conditions of employment are offered including good salaries, a review is due in early summer, five weeks annual leave and relocation expenses where appropriate. The company's ongoing expansion yields real prospects for career development within an exciting environment. Telephone the number below to discuss these positions in detail or write quoting RN2/1903/CW.

## CAREER PROGRESSION FOR A

SENIOR ANALYST PROGRAMMER/TECHNICAL SUPPORT PROGRAMMER/TIMESHARING SPECIALIST

LONDON, W.6 IBM 303X UNIVAC 1100 MINIS TO £11,500

Our client's highly successful international business operation in the field of engineering and construction is supported by an efficient and professional computing and data processing services department. Due to the increased demand for these services the Information Services Department now wishes to appoint an additional person to provide internal consultancy and technical liaison.

The Data Processing Support Group is responsible for a wide range of computing services, including timesharing application support, technical support, consultancy, user education, the evaluation of new software and the design and implementation of special systems. Current projects include real-time database development and minicomputer systems. This post therefore offers the opportunity to extend one's computing experience in the broader range of data processing.

Applicants will offer in excess of five years' data processing experience and may currently be engaged in one of the activities described above. A knowledge of high-level languages — such as COBOL or FORTRAN and experience with some of the relevant hardware is important although candidates who can demonstrate sound experience of other software and hardware and invited to apply.

The company offers an excellent package of benefits together with the opportunity for travel to overseas locations.

To discuss this challenging career opportunity contact Myriad Appointments.

Ref: N1/1903

**MYRIAD APPOINTMENTS LIMITED**

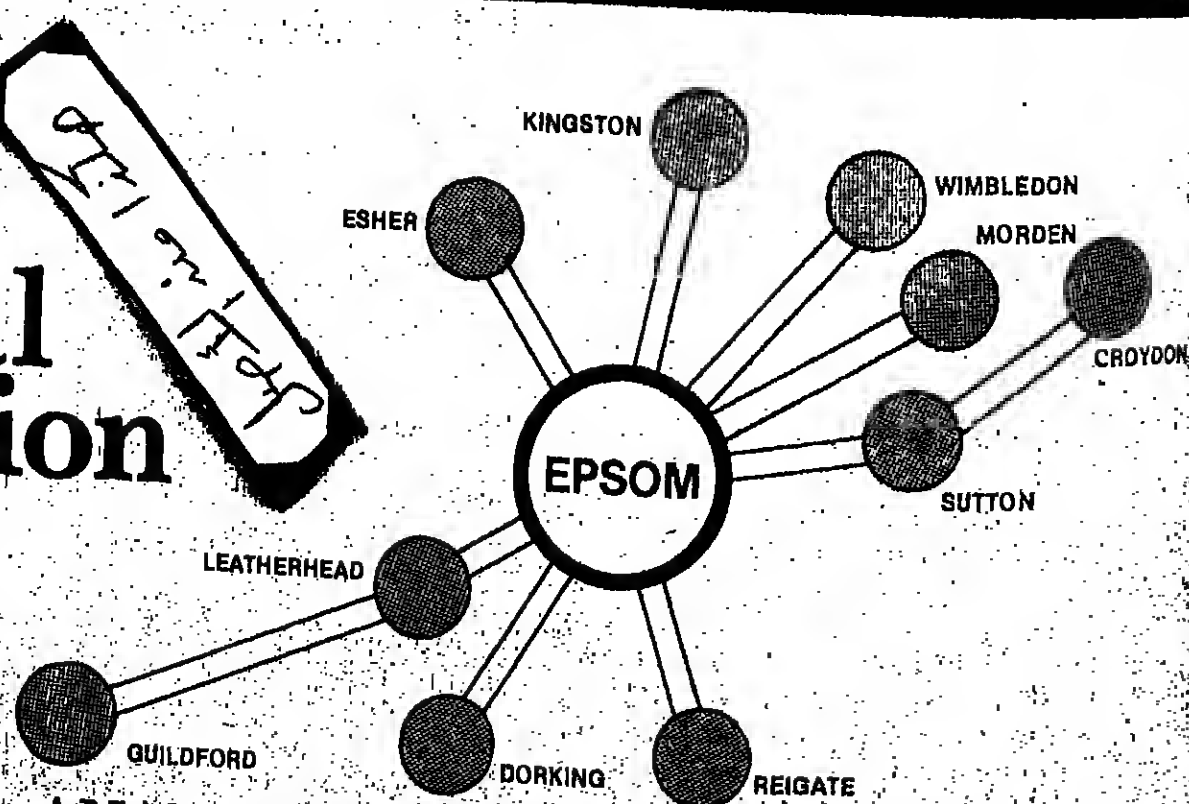
30 Fleet Street London EC4Y 1AA Telephone 01 353 0981 24 hours

# Epsom Financial Organisation

Work locally on a new ICL ME29 and enjoy job security in a friendly expanding company.

Pension funds are a growth industry. Increasing size and sophistication demand new techniques. Our client's funds include one of the twenty largest in the country. Continued expansion has necessitated a further hardware upgrade and an ICL ME29 under TME will arrive in April. Program development is continuing including on-line applications and the evolution of an Investment Accounting system, ensuring interesting developments over the next several years.

The company has comfortable offices in the attractive market town of Epsom, with good rail and road links. The Computer Department is friendly and professional with a progressive attitude towards training and career development, with six monthly salary reviews, 4 weeks holiday, 50p LVs, good pension scheme etc.



**ANALYSTS**  
c. £10,000

You will be involved directly with users to establish requirements in major business areas, carry out feasibility studies and control projects to implementation. At least 2 years practical experience is required, ideally gained in a professional COBOL environment.

**COBOL PROGRAMMERS**  
to £8,500

Applicants should have three years COBOL experience, ideally gained in an on-line environment.

For more details or to arrange a meeting, after office hours if necessary, please write or telephone (24 hour answering) quoting ref: CW 109-IT

**CAPP ASSOCIATES**  
01-686 9693

Capp House, 96 South End, Croydon CR9 3SD  
Computer and Professional Personnel Consultants



## HEXAGON CONTRACTS from £300 to £750 p.w.

IMS/ADF COBOL PROGS	12 Mths +	8100 DPPX COBOL/DPCX ASSEMBLER	6 Mths +
CICS/OL1 COBOL ANALYST/PROGS	3-6 Mths +	PROGS	Indef.
HONEYWELL To work on DPS 8/20		B6800-GEMCOS, COBOL, DMS II PROGS	3-6 Mths
GM4 ANALYST/PROGS	12 Mths	MARK IV PROGRAMMERS	Indef.
IMS DB & DC SYSTEM DESIGNERS	6/12 Mths	UNIVAC 1100-COBOL, DMS1100, TIP	4 Mths
INSURANCE & BANKING ANALYSTS	3-9 Mths	NEAT 3 PROGS	4 Mths
HP3000-COBOL, IMAGE, QUERY, VIEW	6-12 Mths	SYS 34, 38 RPGII, RPIII PROGS	3 Mths +
IMS DB/OC Troubleshooters	Indef.	MACRO 11 & PRIME SYSTEMS PROGS.	3/6 Mths
		VME/B, FORTRAN PROGS.	Indef.

To discuss these and many other contract opportunities, please call any weekday up to 8 p.m.

**HEXAGON**  
computer services

01-438-3571

## EDP Auditors

Our Corporate Audit Department, which performs EDP and financial audits world wide, has an ongoing requirement to replace auditors being transferred to management positions after approximately 3 years in the department. Our immediate requirement is for:

**TRAVELLING EDP AUDITORS** to perform audits in overseas affiliates, all expenses paid for self and spouse, plus an overseas allowance, returning to the UK only for annual leave.

**LONDON BASED EDP AUDITOR** concerned mainly with UK and some European affiliate audits. On European audits usually returns to UK at weekends.

The work involves the audit of Systems and Data Processing installations, appraisal of internal controls and operating procedures of computer systems, and discussion of findings and recommendations with senior management culminating in submission of reports.

Candidates should be aged 25-35 with at least 6 years experience with large scale IBM computer equipment, and mini computers, and in systems analysis, programming, project management and computer operations. Professional accounting qualification not essential but some experience or training in accounting necessary. Ability to communicate effectively at all management levels is essential. Knowledge of French or German an advantage.

Please write with details of qualifications, experience, age and current salary to Overseas Recruitment Department, Mobil Services Company Limited, Mobil House, 54-60 Victoria Street, London SW1E 6QB quoting reference CWCPTA.

**Mobil**

## SALES PROFESSIONALS

VERY HIGH BASIC - 2-LITRE CAR  
EXCELLENT COMMISSION (UNLIMITED)  
OTHER BENEFITS

Good prospects for early promotion

Our client will be interested in talking with you if you have a successful sales record and a working knowledge of one or more of the following:

Commercial Applications  
Distributive Processing Systems  
Communications  
OEM Sales  
Key to Disc

In return you will be offered the opportunity to use your professional skills in an exciting environment with unlimited earning potential. In the first instance telephone Camberley (0278) 32888 (office hours) or Farnborough (0252) 516878 to 10 p.m.

**CCAB**

COMPUTER CONSUMER ADVICE  
BUREAU LTD.  
Computer and Recruitment  
Consultants  
5 Green Lane, Blackwater  
Near Camberley, Surrey

## SALES ENGINEERS

*Simulation and computer graphics systems*

Sales engineers are needed now to meet the growing demand for one of the most exciting product ranges in Europe. R & H specialises in simulation systems and computer graphics; manufactures Applied Dynamics computers in the USA; has Europe-wide franchises for Vector General, Genisco, Comdyna, Datwest, IGS and other big names.

The UK company is based in Worthing but sales engineers are required throughout the U.K. To apply, you must have experience of either simulation; CAD; or graphics. Salary and benefits are highly competitive. The opportunities for future growth excellent.

Send detailed C.V. to van Rietschoten & Houwens (UK) Limited, Crescent House, Crescent Road, Worthing, West Sussex BN11 1RS. Tel: Worthing (0903) 206096.

**JBA**

## S/W Specialist - Real Time Systems

Cleveland to £10,000

An organisation specialising in purpose built control systems has a first class SENIOR opportunity involving:-

- \* R/T Software Design for T.I. Micros.
- \* High reliability technical applications.
- \* Major project responsibility.
- \* A challenging professional environment.

Applicants should have a qualification in a numerate discipline and with at least 3 years experience of developing technical or basic software using ASSEMBLER level languages. Previous experience of T.I. minis or micros and higher level languages would be advantageous but is not essential.

"Excellent promotion prospects in an expanding company." Contact: Bev Stevens

## Senior Analyst/Systems Analyst

Bristol to £8,000 + low interest mortgage

A well respected company maintaining a prominent position in the field of finance now wish to appoint a further SENIOR ANALYST and a SYSTEMS ANALYST to assist in the development of major computer systems.

Applicants should have several years systems experience and for the SENIOR ANALYST position have been involved in the entire development of at least one significant project. Ideally they will have experience of data analysis plus structured system techniques and a knowledge of data base and data communications would be useful. Previous supervisory experience would be an advantage for the SENIOR role. Impressive and congenial working conditions plus excellent range of benefits.

Contact: Mike Galtwell

## Senior Programmer/Systems Analyst

Birmingham Salary + Bonus

SERCK HEAT TRANSFER, leaders in heat exchange technology have recently undertaken a major expansion including the installation of an ICL 2905 operating under DMS/2. They are now looking for additional staff to work on their On-Line Development Plan. The Senior Programmer should have at least 3 years COBOL with some Filetab. MTS would be a definite advantage.

The Systems Analyst should have a minimum of 2 years experience including implementation of at least 1 major project. OMAC and MMS experience is an added advantage.

The positions offer excellent salaries and attractive fringe benefits including a monthly bonus.

Contact: Christine Pountney

**JAMES BAKER ASSOCIATES,**  
International Personnel Consultants,  
Gateway House, 50 High Street,  
Birmingham B4 7SY.  
Tel: 021-643 7865.

## PROGRAMMER

AMICUS SYSTEMS LIMITED is a young and growing company designing and producing microcomputer systems for an expanding area of technical applications.

Our software team needs the assistance of an experienced PROGRAMMER who has plenty of initiative and is at home with both high and low-level languages.

Could you take responsibility for complete projects, from software design to five running? Would you enjoy the chance to work close to the hardware as well as on high-level application development? Do you welcome the opportunity to grow with the company and have your ideas encouraged? For the right person, the salary would go into 5 FIGURES.

If so, Contact us at:  
175-179 St. John Street, London E.C.1  
Telephone 01-837 1865

**AMICUS SYSTEMS LIMITED**

## VIDECOM

An independent, entirely British company that has established a worldwide reputation for technical innovation and high reliability of its products is currently seeking field service engineers, preferably with experience on Terminal Cluster Systems, in the following locations:

**BIRMINGHAM, BRISTOL  
DARLINGTON, GLASGOW  
MANCHESTER, NOTTINGHAM  
AND READING**

Salary negotiable + Car + Training

Contact Peter Sopp on Reading 689141 for details and application form.

## LIVERPOOL POLYTECHNIC

COMPUTER SERVICES DEPARTMENT

## PROGRAMMER

£5,952-£6,750 per annum

A new computer system is being installed during the summer to provide interactive facilities for all Polytechnic departments. The new computer system, supporting all Polytechnic departments, will be operating in parallel with the existing ICL2905 batch system.

The Polytechnic Computer Services Department was created last year: 18 months ago and working levels within the department on the programme are high. The successful applicant will be expected to play a major role in the installation of the system and the establishment of an effective computer service for the Polytechnic.

THIS VACANCY OFFERS A UNIQUE OPPORTUNITY TO BE INVOLVED AT THE START OF A MAJOR DEVELOPMENT PROGRAMME.

PLEASE QUOTE REFERENCE LP/88

Applicants are invited to submit their applications, on request to obtain a copy of the Personnel and Computer Services Department, to the Personnel and Computer Services Department, Liverpool Polytechnic, 150, Victoria Road, Liverpool L3 5ET. Tel: 051-708 5000. The Personnel and Computer Services Department is open from 9.30 a.m. to 5.00 p.m. on weekdays.

## SERVICE PROGRESS

LONDON - HOME COUNTIES

**FIELD SYSTEMS ENGINEERS** (day + night) Growth of 100% per annum demonstrated the forward looking attitude of this major U.S. mini manufacturer. This growth has led to important vacancies within the service organisation. Product training in both U.S. and Europe and early promotion will boost your career if you can demonstrate computer experience and mature attitude to work.

**SERVICE ENGINEERS** (day + night) - BUPA Our client, major U.S. mini manufacturer with over 20,000 installations worldwide, is offering exciting career opportunities in London/Horsham Counties to ambitious service engineers. Comprehensive product training on an extensive range of high performance systems will be offered to suitable young engineers seeking an opportunity to join one of the world's most respected manufacturers.

Call Keith Wallis on any of the above and many others in

**ALLTRONICS PEOPLE**

01-845 4444

## the OCC Column

your link with the grapevine

## BANKING/TECHNICAL CONSULTANTS

London based. £12-£18,000 + good benefits

This subsidiary of a large group provides a specialist international banking service for clients in the U.S., Europe and Africa. The company is one of the largest, longest established international consulting services organisations in Europe. They have a wide range of consultants in the banking and technical field. Applicants should possess at least 5 years' practical DP experience with the ability to program in at least one commercial programming language. They must be willing to travel and work in the U.K. and overseas. In addition, as the job titles imply, they must have relevant banking and technical experience. The company provides a first class benefits package in addition to a substantial basic salary. For more information, contact Tony Staples.

## CONSULTANTS. Middlesex

£8-£17,000 + good benefits

Due to the challenge of meeting strict deadlines and at participating in the sales effort of the leading European software house by offering a minimum of three years' commercial accounting applications (preferable) experience and an in-depth knowledge of a high-level language. You will be interested in extending your general computing expertise and ability to solve business problems for a wide client base. Contact: Anne Powell.

## INTERNATIONAL SYSTEMS ANALYST

Middlesex. Up to £10,500

Based in the UK, you will travel to Europe to advise on and implement new systems. Effective communication skills, at least 2 years' DP experience, including 12 months' COBOL programming with 12 months' analysis and preferably a knowledge of MCB equipment, will fit you for this challenging position. Contact: Anne Powell.

## ANALYST/PROGRAMMER

Herts. £ negotiable

A small, friendly software house specialising in packages for commercial applications, requires several Analyst/Programmers to work on the development and maintenance of new and existing systems. Applicants should have experience of RPL using IBM OSO equipment, especially System 34. If you are self-motivated and have a keen interest in programming, this is a most welcome opportunity. Why not call Anne Powell to discuss in more detail.

## PROGRAMMERS

Middlesex, N.W. London. Up to £9,000

We have varied requirements for programmers, predominantly IBM, UNIVAC & ICL COBOL in the above area and elsewhere. Many of the positions have added interest by way of systems design or analysis involvement and relevant experience. In addition to programming, is most welcome. Why not call Anne Powell to discuss in more detail.

## ANALYST/PROGRAMMERS

S.E. London. £10,000 + benefits

(Half-year reviews)

A well-known service bureau has established a specialised data processing service to challenge, professionalise, and develop the skills of its staff. The rapid development of these services has involved the growth of a modern DP installation based on powerful mainframe, mini and micro computers. Analyst/Programmers are required in the DEC and IBM groups, to contribute to the ongoing operation. Applicants should have 2 years' minimum experience of BASIC + for PDP 11 in commercial applications or two years' IBM COBOL (Assembler and/or MK IV knowledge would be useful). Contact: Tony Staples.

## ANALYST/PROGRAMMER

Berkshire. Up to £8,500

There is an unusual career opportunity with our client, a centrally located prestige organisation having the latest IBM configuration and planning a major upgrade exercise. A well qualified, determined person able to communicate well and work to high standards, is required for the European support centre to assist in the development/implementation of a new processing systems and future enhancement. In addition to SW house design and European systems support. Essential experience is 2 years' minimum COBOL and systems responsibility in a small 370 DOS environment; 4800 on-line systems design experience is a definite advantage. Contact: Steve Fenton.

Please complete this coupon and return (no stamp needed) to  
OCC, 16 Bedford Row, FREEPOST, London WC1R 4BR.

Name \_\_\_\_\_  
Address \_\_\_\_\_

Phone No's: home \_\_\_\_\_ work \_\_\_\_\_

Please provide brief details of experience of vacancy required (quote any of the above if applicable).

## OCC Computer Personnel

01-242 9356

24 hours answering service (CWA)

FOR  
CLASSIFIED  
ADVERTISING USE

DIRECT LINE

01-661 0121

## U.S.A.

**WHO:** Computer Task Group Inc. (CTG), one of the largest professional software services companies with over 800 employees located throughout the U.S.

**WHAT:** "Bright" Computer Professionals with 2+ years' experience as programmers, analysts or designers. Non-IBM background will be considered.

**WHERE:** LONDON INTERVIEWS: April 8-8 (expenses reimbursed)

**WHERE:** Royal Lancaster Hotel, Lancaster Terrace, London W2 2TY. 01-262 8737.

Spend 12-18 months on our professional staff with full company paid benefits. Relocation including return airfare paid. For further information or to schedule a phone or U.K. representative (reverse charges accepted) L. Levine, beginning April 1.

NOTE: THERE MAY BE OPPORTUNITIES TO REMAIN WITH CTG IN THE U.K. UPON YOUR RETURN.

## SERVICE MANAGER

Versatec, part of the Xerox Group, is a Californian company supplying high technology electrostatic computer peripherals for scientific and commercial applications.

Don't our present Service Manager has won a deserved promotion to California, so we want to hear from his replacement. Applicants (male or female) should have proven experience in the computer industry as a Service or Deputy Service Manager, a good technical background and a strong character.

The salary is above average, a company car is provided, and BUPA membership is amongst the benefits offered. Assistance with relocation will be provided if necessary.

Contact: Bill Boffin for further details.

**VERSATEC**  
XEROX COMPANY

Versatec, 27/33 London Road, Newbury, Berkshire RG13 1JL. Telephone: Newbury (0635) 4242.

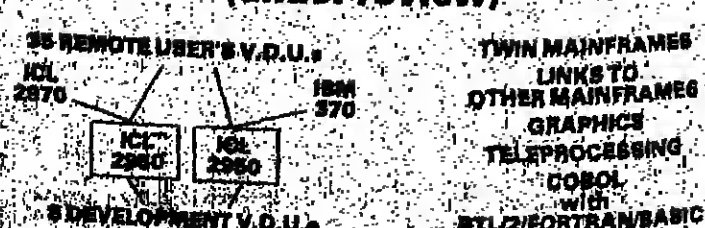
## southern electricity

MAIDENHEAD

## PROGRAMMER

SALARY UP TO £8,000

(under review)



If you are interested in working on new real time projects on upto-date equipment and have at least one year's programming experience, contact Mike Shore of Graham Thorpe or telephone 01603 2166 or write for an application form to Mrs. Pam Polak at Southern Electricity House, Littlewick Green, Maidenhead Berks. SL6 2QB. quoting 01603 2166 or 01603 2167 to 10 p.m. on the 17th of April, 1981.

01-242 9356



Recruitment **LOGISTIX** in informatics

## Communications Software

Southern Germany: Salary to £15K

Communications Engineers from Programmers/Analysts to Team Leader level are urgently required by one of Europe's leading suppliers of communications equipment. Software development teams, based in their R&D Headquarters, are currently engaged in the design and construction of an advanced telephony system based on Intel 8086 microprocessors. All applicants must possess at least two years' real-time software development experience on any leading mini or

micro-computer and be fluent in one high-level problem oriented language such as PASCAL, CORAL or RTL/2. For the more senior positions it is also necessary to be familiar with an Assembler language and be capable of supervising a small team of Programmers and Analysts. Initial interviews will be held in London and those who are successful will be invited to the Company's premises prior to offers of employment being made. Ref: L/13/A

## Technical Consultants

Central London: Salaries to £15K

Outstanding opportunities have arisen for candidates to join a long established and successful computer consultancy based in Central London. You should be aged 28-34 years and educated to at least degree level. It is essential that all applicants possess good personal communication skills and demonstrate the ability to solve problems both quickly and

professionally. Of particular interest will be candidates who have experience in Telecom. computer consultancy based in Central London. You should be aged 28-34 years and educated to at least degree level. It is essential that all applicants possess good personal communication skills and demonstrate the ability to solve problems both quickly and

## Commercial Programmers

Berks/Surrey: Salary to £8K

Commercial Applications Programmers with at least 2 years' experience are urgently sought by a small, profitable Systems and Software House. It is essential that all applicants are familiar with at least one high-level language, preferably Fortran, but those fluent in Cobol or other commercially oriented languages are encouraged to apply. Our clients have a

stated preference for candidates who have worked on DEC's PDP11 range but particular hardware experience is not a limiting factor. These positions represent a rare opportunity for successful applicants to enhance their technical skills whilst working in an attractive rural setting. Ref: L/13/C

## Graphics Consultants

Thames Valley: Salary to £16K

A leading supplier of CAD/CAM Graphics Systems is seeking several Senior Applications Consultants. The Company is based in most attractive area within minutes drive of extensive rail and motorway facilities. Successful candidates must offer recent involvement in one or more of the following areas: pre-sales feasibility studies, post sales graphics support, advice to users on CAD

problems, first-time installation of systems with training of designers and draughtsmen, specialised industrial knowledge of RC Machining. In addition to an above average salary the Company offers an extensive range of worthwhile benefits including a profit share scheme. Where necessary, relocation assistance will be given. Ref: L/13/D

## Cobol Programmers

H. Counties/Holland: Salaries to £13K + car

A leading Systems and Software House, which has expanded rapidly over the last 5 years, currently requires COBOL Programmers for both U.K. and Dutch offices. Applicants should be graduates with a minimum of 3 years' programming experience on any mainframe, mini or micro computer. Working as a

member of a small team you will be involved in the development of bespoke software for various clients including most major computer manufacturers. The company offers outstanding benefits including 14 months salary per annum, a company car, an annual bonus and an equity stake. Ref: L/13/E

## Software Designers

Teesside: Salary to £8.5K

A well-known Electronics Company with recent diversification into process control and medical computing is seeking several Software Designers and Programmers. The company's system is micro based and operates in a distributed processing environment. Particular programming experience must include one or more of: CORAL 66, PASCAL, RTL/2 or

Assembler. Systems software experience should include both device handlers and computer processors. You will play a large part in the specification, systems design, implementation, test and documentation stages. Relocation assistance is available where necessary. Ref: L/13/F

## Syst. & Prog. Consultants

London & Home Counties: Salaries to £17K

One of Europe's leading independent software houses has a number of vacancies at all levels for Systems and Programming Consultants. Applicants must have a minimum of 3 years' commercial experience and be fluent in at least one 'high-level' language, preferably Cobol, whilst knowledge of an Assembler language is an advantage. Particular hardware experience

is not important, the primary requirement being a strong interest in systems development and business problem solutions. Unfilled opportunities for promotion exist and therefore these vacancies will appeal to ambitious candidates with a true sense of their worth and capabilities. Ref: L/13/G

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 **LOGISTIX** Tel: 01-2800

UNIVERSITY OF GLASGOW  
COMPUTING SERVICE

### SYSTEMS PROGRAMMER

Applicants are invited to join the central Systems team responsible for developing and maintaining the operating system software on the University's ICL 2978 Computer. The successful candidate will be responsible for the maintenance and development of VME/RS operating system and will be expected to acquire an overall familiarity with the VME/RS operating system and to accept responsibility for maintenance and development in specific areas of system software. The appointment will be made on the full-time basis (9.00 am to 5.00 pm) with a salary of £10,000 per annum. Other Related Staff, currently in the range £8,000 - £10,000, with initial placement depending on age and experience.

Further particulars may be obtained from the Secretary of the University of Glasgow, Glasgow G12 8QQ, with whom applications (in copies), giving the name and address of the applicant, should be lodged on or before 17th April, 1981.

In reply please quote Ref. No. 4806.

(4822)



Anglian Water  
Authority

### DISPOSAL ICL 2903

The Division has to dispose the following:  
ICL 2903  
Card Reader  
300 LPM Line Printer  
FEOS & EOS IEDS 6J  
EOS 6 Office

For further details contact the Computer Manager at the address below.

LINCOLN WATER DIVISION  
Waterleia House  
Waterleia North  
Lincoln, LN2 8HA  
(Tel: Lincoln 28251  
Ext. 224)

(4808)

### COMPUTER SERVICES DEPARTMENT

Re-advertisement

### TECHNICAL AUTHOR £9,576-£10,731

Required to set up a technical library on internal information service and documentation standards for the Department.  
Applicants should have a degree or relevant professional qualification (H.B.C.S. or A.B.C.S.) and have six years experience in the computer industry.  
Previous applicants need not re-apply.

Application forms, available from the Computer Services Manager, Room 1.76, Town Hall and Civic Centre, Sunderland, SR2 7PL, to be received by Friday 10th April, 1981.



borough of  
sunderland

## Contracts Midlands

Top rates  
paid promptly

Why not come and talk to us and find out the reason why contractors (both freelance and permanent) select us and stay with us for so long. Our current requirements vary from 3 to 12 months and we particularly need

- IBM PL/1 OS
- IMS DB and/or DC
- IBM or Burroughs or Honeywell COBOL
- 370/8100 experience
- Business Analysts

S.P. SUPPORT LIMITED, St. Martin's  
House, Bull Ring, Birmingham, or  
Telephone 01-632 4304 or 0602 222227.

## Targa

### IBM MVS

Large International Company in Central London requires a SHIT LEADER for their busy installation. The successful applicant is expected to possess the following attributes. He or she will have a minimum of 5 YEARS' experience and be aged over 25 with CURRENT SHIT LEADER STATUS and proven man-management skills. The specific requirements for this position are a detailed knowledge of MVS/JES2 or JES3, IMS, VTAM, and either TSO or VSPC. An ability to act as a JCL Technician is also expected because of the need to sort out problems on shift. A vacancy also exists for a SENIOR OPERATOR with approximately 3 YEARS experience of MVS who can expect a salary of up to £9,000. Ref: 2367

### PDP RSX

A site in the CITY of LONDON requires an Operator for their installation which comprises multi-machines including PDP 11/70 and VAX. A minimum of 9 MONTHS' experience of PDP hardware utilizing RSX, with VMS if possible, is required. A straightforward 3 shift system is in operation with good Company perks. Ref: 3321

### BURROUGHS

A large site based in the CITY has a vacancy within the Computer Department for an Operator. The applicant must have at least 18 MONTHS' experience on ANY LARGE BURROUGHS system. An excellent range of benefits are available including 3 weeks holiday in first year along with 80p L/Ve per day. A 3 shift system is currently in operation. Ref: 3308

### ICL

Our client based in the CITY has a requirement for an Operator. The Company requires a minimum of 3 YEARS' experience on a 1900 configuration. The applicant must be willing to work under a 2 shift system. Excellent benefits are being offered together with numerous promotion opportunities. Ref: 3268

### DATA CONTROL

We have two vacancies for people with some Data Control experience. One is a City based Company offering attractive salary with good perks. The other is in the West End and is with a well-known International Company. Both positions are DAYS ONLY. Ref: 3322

TARGA COMPUTER  
SERVICES  
6 LIVERPOOL STREET  
LONDON EC2M 7NH  
01-283 9941

24 HOUR  
ANSAPHONE

(4808)

## SENIOR SYSTEMS ANALYST

Bristol c.£9,000  
Bentley Limited is wholly owned subsidiary of Bentley Corporation of America, manufacturing Compressed Air Breking Equipment for the European Commercial Vehicle Market.

The Senior Systems Analyst will report to the Operations Manager and deputise in her absence. The responsibilities of the function will cover design and implementation of new systems and the enhancement of existing systems as changes require. Over the next 2 years the review and replacement of the materials requirement planning system.

The basic requirements are a minimum of 4 years' design and analysis work, or programming background in COBOL and preferably TPS, a knowledge of ICL utilities and experience of real-time preferably using TPS. The installation is ICL 1902T with a communications network supporting Video and Terminals with materials planning, stock control, accounting, standard costing, and order entry applications.

Included in the Company's benefit package are Private Medical and Permanent Health Insurance schemes, Pension and Life Assurance schemes and salary c.£9,000.

Please apply briefly in writing to the Personnel Officer.

Bentley  
Douglas Road, Kingswood  
Bristol BS15 2NL  
Tel: (0272) 671651

## EUROLEX

A European Law Centre Service

### DATABASE MANAGER

This is a responsible position for a reliable conscientious person with good knowledge of database systems and a strong interest in the development of database systems. The successful applicant will be working on an important project to develop a database system for a major retail software package with an estimated value of £100,000. A good understanding of computer systems is necessary; programming experience on any leading mini or micro computer is an advantage. The position involves the following functions: (a) to develop and maintain the database system; (b) to develop and maintain the database system; (c) to develop and maintain the database system; (d) to develop and maintain the database system; (e) to develop and maintain the database system; (f) to develop and maintain the database system; (g) to develop and maintain the database system; (h) to develop and maintain the database system; (i) to develop and maintain the database system; (j) to develop and maintain the database system; (k) to develop and maintain the database system; (l) to develop and maintain the database system; (m) to develop and maintain the database system; (n) to develop and maintain the database system; (o) to develop and maintain the database system; (p) to develop and maintain the database system; (q) to develop and maintain the database system; (r) to develop and maintain the database system; (s) to develop and maintain the database system; (t) to develop and maintain the database system; (u) to develop and maintain the database system; (v) to develop and maintain the database system; (w) to develop and maintain the database system; (x) to develop and maintain the database system; (y) to develop and maintain the database system; (z) to develop and maintain the database system.

The successful applicant should also have a strong interest in the development of database systems. The position involves the following functions: (a) to develop and maintain the database system; (b) to develop and maintain the database system; (c) to develop and maintain the database system; (d) to develop and maintain the database system; (e) to develop and maintain the database system; (f) to develop and maintain the database system; (g) to develop and maintain the database system; (h) to develop and maintain the database system; (i) to develop and maintain the database system; (j) to develop and maintain the database system; (k) to develop and maintain the database system; (l) to develop and maintain the database system; (m) to develop and maintain the database system; (n) to develop and maintain the database system; (o) to develop and maintain the database system; (p) to develop and maintain the database system; (q) to develop and maintain the database system; (r) to develop and maintain the database system; (s) to develop and maintain the database system; (t) to develop and maintain the database system; (u) to develop and maintain the database system; (v) to develop and maintain the database system; (w) to develop and maintain the database system; (x) to develop and maintain the database system; (y) to develop and maintain the database system; (z) to develop and maintain the database system.

## TECHNICAL SUPPORT ENGINEER

Customer Liaison

Europe and USA

The Control Data Corporation of America employs 58,000 people worldwide, engaged in the manufacture of computers and their associated peripherals. At the company's UK plant, situated at Brynmawr on the edge of the Brecon Beacons National Park, we manufacture magnetic media for the computer industry. A £10m expansion programme has recently been completed which has doubled the plant's manufacturing capacity and gives Control Data Corporation the facility to produce products at the very forefront of computer technology. The Company has built its reputation on the quality of its products and its dedication to alter sales technical support. This is therefore a crucial appointment and carries considerable responsibility. The man or woman we are looking for will have a minimum HNC (Electronics) together with

several years experience of the technical problems associated with computer systems, particularly disk and tape drives. In addition to trouble shooting skills, he or she will have powers of tact and diplomacy and the ability to communicate easily with people at all levels.

The nature of the job means that a considerable amount of time (40-50%) will be spent away from home, mainly in Europe but with occasional visits to the U.S.A.

A competitive sterling salary is offered, together with a company car, excellent benefits and employment conditions. Opportunities for further advancement are outstanding to people of the right calibre.

Please write giving brief details of your career to Paul Lloyd, Assistant Personnel Manager, Control Data Limited, Brynmawr, Gwent NP23 4YA. Tel: Brynmawr 311000.

(4808)



CONTROL DATA

## Computer Professional Recruitment Consultancy

We have been exclusively retained by this client for an assignment which is

## CONFIDENTIAL!

SO PLEASE DON'T READ THIS UNLESS YOU ARE A TOP-CLASS TELECOMMUNICATIONS PROFESSIONAL

One of the brightest stars in the computer industry is moving into communications.

- BENEFITS:**
- 1) Ground-floor involvement
  - 2) Multi-million pound group backing
  - 3) Existing service organisation U.K. wide
  - 4) Top-class, proven products
  - 5) Exciting expansion plans
  - 6) Dynamic, realistic and professional management
  - 7) Well above-average remuneration and potential

**APRIL REQUIREMENTS: LONDON/MIDLANDS**  
**THE SIX BEST PEOPLE IN COMMUNICATIONS**

- 1) 4 Salesmen - Digital Communications/Multiplexors, Telex Switches/Network products and systems
- 2) 2 exceptional communications support staff

## CONFIDENTIALITY GUARANTEED

All interviews on neutral ground, no names until you request a meeting.  
TELECOMMUNICATE with Rob Peeling, 0532 778040 or Mike Green, 01-258 0077, quoting R40, for immediate consideration.

Opt Consultants Ltd., Suite 29,  
The Courthouse, 432 Deodar Road,  
Croydon CR9 1DP. Tel: (0882) 374040  
24 Hour Enquiry Recording  
Based in London & Manchester

UNIVERSITY OF  
EAST ANGLIA  
Norwich

Research in Distributed Processing  
The Zero Assignment Parallel Processing Project is investigating the potential for parallelism in functional (FSP) languages where a large number of functions or threads of processing elements are involved in two research paths. Both paths are for a maximum of three years from August 1, 1981. Candidates interested in a shorter period are encouraged to apply. Successful candidates will need to visit related groups in the United States and elsewhere.

### SENIOR RESEARCH ASSOCIATE

Salary scale £5,505-£3,595 p.a. under review.  
The successful applicant will have a Ph.D. and will work on a parallel execution model for the development of a new language which supports virtual process trees.

### RESEARCH ASSOCIATE

Salary scale £4,785-£2,885 p.a. under review.  
The successful applicant will develop a simulation program to model the properties of the execution model. The work may involve using both British and American computer languages into the ARPANET.

Further information may be obtained from: Dr. F. W. Burton or Dr. M. R. Sleep, Computing Studies, School of Computing Studies and Systems, University of East Anglia, Norwich NR4 7TA, England. Applications only which should include a full curriculum vitae together with the names and addresses of two referees should be sent to the Dean, School of Computing Studies and Systems, University of East Anglia, Norwich NR4 7TA not later than 30th April, 1981. The two referees you are particularly requested to give only the names of those who can be contacted by the University.

### SENIOR PROGRAMMER

MANCHESTER POLYTECHNIC  
MANAGEMENT INFORMATION UNIT - ALPHABETIC DATA PROCESSING

The Polytechnic has recently taken delivery of a Honeywell Level 8 model 43 microcomputer to be used initially for a new student record system, developing later into a comprehensive management information system.

This is a three-year appointment on the development of these systems.  
Applicants must have a sound knowledge of COBOL based upon several years' experience of it, and should preferably have degree level qualifications.

A Union Membership Agreement is in operation under which new employees are required to join a recognised union.  
Salary scale: £2870-£7335.  
For further particulars and application form returnable by 13 April 1981 send a self-addressed envelope, marked '9/585' to the Secretary, Manchester Polytechnic, All Saints, Manchester M15 6BH.

(4877)

### THE QUEEN'S COLLEGE GLASGOW

(A Scottish Central Institution)

### LECTURER 'A' in COMPUTING and STATISTICS

Post Reference 9187  
SALARY scale £11,627 (B1) - £11,307

This is a new and challenging post, established to develop a computing service. Further particulars and application forms for the post are available on request. The post reference number may be obtained from:

Personnel Office (C10)  
THE QUEEN'S COLLEGE  
GLASGOW

1 Park Drive, Glasgow G3 7LP  
The closing date for receipt of applications is Friday, 26th May, 1981.

(4814)

### LOTHIAN REGIONAL COUNCIL

DEPARTMENT OF EDUCATION  
STEVENSON COLLEGE OF FURTHER EDUCATION

### Computer Operator

Department of Business and Computing

The College requires a person to be employed on a full-time basis as a computer operator. The successful applicant will be responsible for the operation of the college's computer system. The post is a full-time position, 9.00 am to 5.00 pm, Monday to Friday. The salary is £2,200 p.a. plus benefits. Applications should be sent to the Principal, Stevenson College of Further Education, 100 Colinton Road, Edinburgh EH10 5DT.

(4894)

# Write yourself a brighter future.

To line yourself up with the best opportunities, simply complete the Knight Form and return to us, or telephone now.

## Personal

Please write in ballpoint, using block capitals

Surname \_\_\_\_\_ Forenames \_\_\_\_\_ Mr/Ms (please)

Address \_\_\_\_\_

Tel. Home \_\_\_\_\_ Office (discretion will be used) \_\_\_\_\_

Age \_\_\_\_\_ Nationality \_\_\_\_\_ Car? \_\_\_\_\_

Are you prepared to relocate in UK? ☐ Abroad? ☐ (tick box)

## Experience

Place no. of years in box, e.g. IBM 360/370 ..... 168 ..... [4]

Machines	Please specify model	Operating Systems	Please specify version
IBM 360/370		OS	
IBM 303X		DOS	
IBM 43XX		George	
IBM 53/32/34/38		VME/	
ICL 29XX		RSTS	
ICL 190X/290X		RSX	
DEC		GCOS	
Burroughs		MCP	
Univac		Others:	
Honeywell			
Others:			

Job Titles	TP Monitors & Database
DPM/Systems Manager	QICS
Consultant	IMS
Project Leader	IDMS
Systems analyst	IDS
Analyst/programmer	Other:
Systems Programmer	
Programmer	
Ops supervisor/manager	
Operator	
Sales Representative	
Other:	

Applications	Programming languages
Commercial	Cobol
Finance/Banking	PLI
Scientific	Assembler
Process Control	Plan
Telecomms	Fortran
Other:	Basic
	RPG
	Other:

## Position sought

Please state briefly the type of appointment you are seeking

Permanent? ☐ Contract? ☐ Either? ☐ (tick box)

Minimum salary £ \_\_\_\_\_ Notice required/ Date available \_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Cut out the whole advertisement and post to the address below. Phone anytime, or for an application form leave your name and address with our answering service.

Knight **01-491 4706**

Knight Computer Services Limited, 14 Old Park Lane, London W1Y 4NL

Staff Services Division of BOC Computer Services and a member of the Computer Services Association

01-491 4706





## MITSUI

We are a British subsidiary of MITSUI, one of the largest trading companies in the world.

We have developed a very wide marketing versatility throughout the U.K. with an extensive range of products from sophisticated electronic office equipment to the celebrated YAMAHA Motorcycles and Outboard Motors. Univac System 80 Hardware has recently been installed to meet our progressive growth programme, creating the need for a first-class

### SYSTEMS ANALYST/PROGRAMMER

Reporting to the Computer Manager, you will have the perfect opportunity of further developing your skills with the latest technology including planning and implementing new systems throughout the company. The System 80 hardware includes 28 V.O.U.s running in tandem with the present IBM Computer. Knowledge gained from any of the following systems will be required:

OS/J Operating System, DMS Data Base, I.M.S. Information Management System, I.C.A.M. Integrated Communications Access Method Plus programming in either COBOL, RPG II or Assembler. Ideally, you will also be aged around 30 years and located within reasonable travelling distance of Chesham. The employment package is excellent, offering an attractive salary and conditions, including non-contributory pension scheme at 15-18% of annual salary, life assurance, subsidised meals, luncheon vouchers, discretionary annual bonus, special fringe benefits, a 35-hour week, all in a progressive busy environment. Please send your C.V. or brief resume to the Personnel Manager. All enquiries will be treated with the strictest confidence.

MITSUI MACHINERY SALES (U.K.) LTD.  
Oskecroft Road, Chesham, Surrey

46271

### IBM OPERATOR

SALARY NEG.

A leading computer services and systems company has asked us to find an IBM operator with at least 2 years' 360/370 ODS/GRASP experience.

Although currently based in W.I., the company will be moving to Hanger Lane later this year, where a new Data Processing Centre will house a 4341 running OS/VS1 utilising VM, CMS and GUTS.

The new centre will also house several SYSTIME 6700s, a PRIME 650, and twin HONEYWELL OPS 820s.

Candidates will be given considerable scope in utilising their skills and full training where necessary. For further information contact Mike Mauder on 01-255 5551 or 04747 6568, evenings or weekends.

Ref. 06/13

468471

AGB  
Recruitment  
Limited

### SITE SERVICE ENGINEER

MAJOR INSTALLATION

To £10,000 incl. shift premium

In recent years CTL has won a considerable share of the competitive UK microcomputer market. With substantial investment and even greater emphasis on design, development and support services we are ready to meet the challenges of the 1980s and achieve targeted growth. One of our most complex projects is an advanced, custom-built communications system for a major public service organisation in London. CTL hardware and software installation is complete but software support, preventative and remedial maintenance is carried out by resident engineering teams.

As one of the Senior members of this team you'll be responsible for fault finding and fixing to component level on processors, arrays, disks, printers and control equipment. You'll also act in an advisory capacity on hardware and software maintenance problems as they arise and on innovative mind and the ability to assimilate highly complex technical concepts are essential. Ideally qualified to degree or HNC level, you must have had substantial experience in a similar field engineering role and be prepared to work on a rotating shift system. Good communication skills and a high degree of self-motivation are essential qualities.

A good basic salary is enhanced by a shift premium bringing potential earnings to around £10,000 p.a. A range of benefits are also provided.

For more information or an application form telephone John Wilson, Area Service Manager on 01-605 6307. Or write to him with full career details at: CTL, 5-8 Long Lane, London EC1A 4JH.

**CTL** Computer Technology Limited

CTL An Information Technology Company

### PROCESS CONTROL

Programmers and Analysts with 3+ years' mini or micro assembler (DEC in particular) experience plus relevant degree required by producer of Industrial Control and Automation Systems. Offices in Heris.

£7-11K

### ICL 2900

Designers and Analysts/Programmers with real-time, on-line experience on large 2900s, and some networking/knowledge gained by producer of Industrial Control and Automation Systems. House to meet requirements of new and existing projects.

£8-11K

### GERMANY PDP 11

Software Engineers with real-time PDP 11, RSX 11M, background sought by small computer team within industrial Measurement/Production Control Supplier in pleasant Rhineland location. Willingness to learn German essential.

£10-14K

### REAL-TIME MINIS

Analysts and Programmers needed to join Flute-based teams working for leading U.K. Systems and Software House in scientific and technical projects. At least 5 years' in real-time required. Coral, Fortran and Assembler or PDP11, OG Nova, Ferranti GEC desirable.

£8-12K

### MICROS LONDON

Experienced or aspiring Sales Engineers sought by leading Microcomputer Manufacturer for the London area. A strong technical background in micros plus experience dealing with clients more important than specific sales experience. Likely candidates will be in age range 25-30.

c.£12K+Car

### COBOL MIDDX.

COBOL Programmers to Team Leaders urgently required to meet expansion plans of this leading Computer Manufacturer. Based in West Middx. you will be working on the development of new products.

£7-10K

### SYSTEMS SOFTWARE

Specialists in Compiler design, operating systems and database design (minis) are being sought by a number of our clients in Central Southern England, Germany and Switzerland. DEC and Pascal experience of particular interest.

£9-17K

### U1100 MIDLANDS

Analyst/Programmers in OS design and software support required for U1100 installation in West Midlands. COBOL plus Codedyl database experience (esp. OMS 1100), or Univac operating system knowledge particular sought.

To £10K

### ZILOG SURREY

Designers/Programmers being recruited now to work on a new stand-alone, zilog-based word processor. Involved in challenging technology you will work in multi-processor based shared resource systems, message passing interfaces, access mechanisms, etc. Graduates preferred.

£8-10K

### WILTS DEC & INTEL

Programmers and Analysts/Programmers with experience in telecontrol, process control or related fields on DEC (under RSX 11M) or Intel equipment can escape to the West Country. Interesting design and development work on clinical applications with well established company.

£7-10K



10 Grenville Place  
London SW7 4RW  
01 373 3063

DOE Lic No SE(A)127

### IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

#### SYSTEMS ANALYST

Administrative Computer Unit (Re-Advertisement)

Experienced systems analyst required to assist with the further development and integration of the College's central administration computer systems. Experience in the finance field advantageous.

Salary in Administrative Grade II range £11,127-£13,277. Superannuation under USS.

Five weeks' annual leave.

Further particulars and application form from the Personnel Secretary, Imperial College, South Kensington, London SW7 2BZ. Tel: 01-595 5111. Fax: 01-595 5112. Post 15, 1981.

46271

### CLASSIFIED ADVERTISING USE

### DIRECT LINE

01-661 0121

## Computer Networks Development

Posts are available in the Computing Division to work on a number of developments in the area of computer networks. The Science Research Council has a large X25-based network covering most of the country and this is still being actively developed.

Locally the Laboratories are investigating both Cambridge Rings and Ethernet as a possible basis for a local area network covering the Chilton site.

The Rutherford and Appleton Laboratories have strong links with CERN and are participating in the European STELLA experiment on high-speed broadcast communications via wavelets.

Applicants should have a degree in computing or some related subject and, preferably, some experience in the network area.

Posts are based at Chilton and will be in one of the following grades:

Scientific Officer	£4,809-£6,480
Higher Scientific Officer	£6,075-£7,999
Research Associate (fixed 3 year term)	£5,862-£8,006

Appointment to a salary scale point above the minimum may be considered for candidates with good qualifications and particularly relevant experience/specialist training.

The Laboratories are a friendly community with their own restaurant and extensive sports facilities nearby. We offer excellent working conditions and benefits include a local transport service, generous holidays, sick leave allowance and a non-contributory superannuation scheme.

For an application form please write to: Mary Elizabeth Fry, Personnel Group, Science Research Council, Rutherford and Appleton Laboratories, Chilton, Didcot, Oxon OX11 0QX quoting reference MN915. Closing date: 10th April 1981.

Rutherford  
and Appleton  
Laboratories

## SAUDI ARABIA

IR £17,500-IR £24,000 P.A. TAX-FREE

FREE housing, air fare, use of car, etc. Allowance for spouse. 4 weeks' annual holiday.

### ANALYST/PROGRAMMER

For 1 year

3 years' minicomputer programming (preferably Data General); Fortran; Cobol helpful; experience in accounting, payroll, etc.

### SYSTEMS ANALYST

For 6 months or more

8-10 years' D.P. experience including 4 years' programming; IBM 370 or 4331; experience of project management, systems design, database development, control systems, etc.

### PROGRAMMER

For 6 months or more

5-6 years' programming, preferably IBM Cobol; knowledge of IBM PROJAGS helpful.

MANY OTHER POSITIONS AVAILABLE.

Interviews will be held in DUBLIN, LONDON, etc.

Phone (0001) 306902 for further details.

46271

### PROJECT PROGRAMMER

Circa £9,000 p.a.

Cheshire/Staffordshire Border

Our client, one of the world's largest Electronic Companies producing the most comprehensive range of advanced TLC and mini-micro computers, are seeking an experienced programmer.

The ideal candidate will have Real Time computer experience preferably gained in an environment such as M.O.D. Plessey, Muller, Car Manufacturers, Allied to extensive knowledge of Fortran and Assembler languages.

Comprehensive training is provided with the successful applicant spending their first year at the Company's European Headquarters, where both product training and German language tuition will be provided. Free accommodation and generous expenses are extended during this period. On return to the U.K. the applicant will provide leadership qualities and technical expertise to existing personnel.

Generous benefits package and relocation assistance as befitting a major organisation. Ref. 71/72.

For further information contact:  
Peter Higgins on 0274 22824  
(Revenue charge calls accepted)  
or send full C.V. to:  
WINDSOR RECRUITMENT CONSULTANT  
THE WOOL EXCHANGE, MARKET STREET, BRADFORD  
BB1 7LB.

46271

## MYRIAD

# DIGITAL TELECOMMUNICATIONS

## PROGRAMMERS (1-3 years) : GRADUATES (1981)

### WILTSHIRE

£NEGOTIABLE

These are excellent opportunities for programmers, with experience of real-time systems, and students expecting to graduate this year to join a company at the forefront of development in both computer controlled and fully digital telephony systems. This is an expanding field which will become increasingly important through the next two decades and the company is therefore committed to long-term development.

You will become involved in:

- ★ Advanced digital switching technology
- ★ CCITT signalling systems
- ★ Telephony applications programming
- ★ Device level software design
- ★ Admin. and subscriber facilities

From the Programmers we are seeking:

- ★ 1-3 years' real-time mini-computer Assembler or high level programming

From the Graduates:

- ★ Ideally the expectation of a good Computer Science degree

These interesting positions, with a successful member of an International group, offer a high commencing salary entirely dependent on experience. This is supported by excellent benefits including a comprehensive relocation scheme, five weeks' holiday and opportunities for overseas travel. Telephone the number below to discuss these vacancies in detail. Alternatively either return the coupon or write to us quoting reference RN1/2603/CW.

## SYSTEMS ANALYST

This is an exciting opportunity for an experienced Systems Analyst to effect an important career move. A substantial City-based international organisation is seeking to recruit an additional Systems Analyst to develop Real-Time Financial systems within an extensive communications network.

£ NEGOTIABLE

If you can offer:

- ★ Two years' plus IBM experience
- ★ Involvement in at least one project
- ★ The ability to solve problems

### THE CITY

Our client can offer:

- ★ A stimulating and highly professional environment
- ★ Real-time design
- ★ Extensive development work using advanced techniques
- ★ Starting salary to £12,000 + excellent benefits

Our client will also consider ASSEMBLER Analyst/Programmers who wish to move into a full systems analysis role.

REF. E1/2603

## SOFTWARE DESIGN GROUP LEADER

SLOUGH

c. £11,000

An extremely challenging opportunity has arisen for a senior technician to join our client in the development of sophisticated CONTROL SYSTEMS with DISTRIBUTED INTELLIGENCE. The company is currently undertaking a major development programme in order to extend its established lead in the field of environmental control and energy conservation.

Controlling and motivating a team of software engineers, the Software Design Group Leader will liaise closely with hardware designers in the development of industrial products using distributed 8080/5 microprocessors. You should be able to combine an in-depth knowledge of ASSEMBLER level programming and, ideally, an understanding of communications systems, with the ability to lead a skilled team.

To discuss this position in detail, please contact Myriad Appointments on 01-353 0981 quoting reference RS1/2603/CW.

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA Telephone 01 353 0981 24 Hours



# Outstanding Opportunities for Project Managers

## N.W. England. Major IBM Site.

Our client is the Computer Services Division of a highly profitable organisation and provides a comprehensive computer service to the companies within the Group.

Functionally the Group is organised into four main sub-divisions and the systems development department is organised similarly to reflect this.

Our clients systems are large, the hardware is large IBM, and data volumes can be high at peak trading times and candidates must have previous experience developing large systems using sophisticated hardware and software.

We are seeking applications for the following two project manager vacancies:

### Stock Control Systems

A project manager is required to lead a permanent team of systems analysts and programmers and to be responsible initially for all stock control systems past, present and future for all group companies.

Your team is permanent and not merely assembled for the duration of a project and as project manager you are in effect the systems manager/advisor/specialist who must identify with, look after and lead your own group of user companies. You would not only be the technician who supervises specific work you are the 'front man' who will lead your users to seek better and more effective use of computer services.

To undertake these arduous and stimulating duties we seek applications from candidates with a number of years experience developing commercial systems, but with extensive experience of stock control systems. You will have a programming background and must have already controlled, using formal methods of project control, a team implementing a number of major systems, which must include complex stock control systems, from feasibility study through to implementation.

This is a senior position requiring a candidate with the personality, flair and imagination to fulfil a demanding role in a progressive data processing division. (Ref CW/8107)

### Manufacturing Systems

A specialist with extensive experience developing computer based manufacturing systems is required to take responsibility for the development of computer systems throughout the groups manufacturing division.

Initially you will work alone identifying the needs for computer based systems and in due course will build a team and lead it in the installation of integrated database systems throughout the division.

Applications for this position are invited from well qualified candidates, preferably graduates, who must have proven management ability and be excellent communicators who can quickly establish an effective rapport with users. Technically candidates must have extensive experience in computing, preferably in a large scale IBM installation and have had successfully a number of projects from feasibility study through to implementation. Specific experience of major production scheduling packages is important and it would be particularly advantageous if this included CAPOSS, which is already in use.

This is a most challenging senior position which offers the successful candidate a ground-floor opportunity to identify major new opportunities for computer systems development and then be the key agent in providing a total service to the Groups manufacturing division. (Ref CW/8108)

Excellent remuneration and benefits packages will be negotiated including a salary of up to £12,000 per annum, significantly more for an outstanding candidate, a company car, non-contributory pension, BUPA and generous relocation expenses in appropriate cases.

Interested candidates are invited to contact Ivor Norton at the Harrogate Office quoting the appropriate reference.

**Ivor Norton Management Services Ltd.**

LONDON  
52, Shaftesbury Avenue,  
London W1V 7DE  
01 734 8862

HARROGATE  
P.O. Box 83,  
Cortwell Tower House,  
Harrogate HG1 1TS  
01423 58828

GLASGOW  
11 Borthwick Street,  
Glasgow G2 6LY  
043 224 8811

24 HOUR ANSWERING SERVICE (0423) 55311

## SOFTWARE MANAGER ZIMBABWE

c £15,000 + Package  
A business systems distributor with a turnover of over £1 million, is seeking a Software Manager to take responsibility for its Zimbabwe Pre-Sales Support Operation. He/she will have carried out sales feasibility studies, and designed and implemented at least two major systems. The successful applicant is likely to have business and accounting experience, together with up-to-date hardware/software expertise, preferably orientated towards DEC/PDP. This is an excellent opportunity to develop your skills in a rapidly expanding market, together with the opportunity of a share in the business.

## ANALYSTS to PROJECT LEADER level LONDON

to £13,000 + Package  
Our client is an international Organisation with a large investment in the development of online systems and are seeking development staff at all levels. The successful applicant will have a minimum of 2 years' programming experience, preferably in COBOL or ASSEMBLER, together with a proven track record in systems development. There is ample opportunity for career progression in a dynamic environment.

## SYSTEMS ANALYST SURREY

£11,000  
An international Manufacturing Organisation is looking for a Systems Analyst with a knowledge of COBOL and/or RPG 2, to perform a key role in the development of major online systems. This position will involve communication with all levels of management, and some travel may be involved.

## PROGRAMMER - CUSTOMER SUPPORT LONDON

c £9,500  
A leading company developing a wide variety of systems for their worldwide network customers, is seeking a Programmer with a minimum of 12 months' experience in COBOL or BASIC, with a knowledge of FORTRAN. This position would ideally suit a self-motivated person who wants to develop their skills in the realm of customer support. A vacancy also exists for a backroom person with a flair for ASSEMBLER. Excellent prospects.

## BASIC (PLUS) PROGRAMMERS LONDON

c £9,500  
We have several vacancies for Programmers with up to 18 months' BASIC, BASIC +, or AIMS experience, with the opportunity to work on batch and real-time financial systems. Excellent opportunities for career progression, plus attractive fringe benefits, including low interest mortgage facility, bonus scheme, restaurant and season ticket loan.

## SHIFT CONTROLLER LONDON

c £11,500  
This large organisation is seeking someone with extensive operational and supervisory experience in the charge of one of their shifts running under MVS.

## SHIFT LEADER LONDON

c £9,700  
A financial organisation needs a motivated and technically competent person to supervise the running of one of their two shifts. At least 4 years' IBM experience is required for this position, together with an in-depth knowledge of DOS/VS, MVS/VS, associated Utilities and JCL, with CICS and VTAM. Attractive fringe benefits include mortgage facility.

## BURROUGHS OPERATOR LONDON

c £7,250  
Our client is looking for a BURROUGHS H6700/6800 Operator with 1-2 years' experience, to work on a variety of online commercial systems.

## ICL OPERATORS LONDON

c £7,000 + Fringe  
Expanding installation is seeking Operators with up to two years' ICL 1900/2900 experience, plus a working knowledge of GDS/VS2 or VMS/VS. Excellent prospects.

## BUICK COMPUTER SERVICES RECRUITMENT DIVISION

72 Rochester Row, Victoria, London SW1P 1JU  
Tel. 01-834 0061 (10 lines). 24-hour answering service.

# Sales Executives

SOUTH EAST  
£17,000 + 2.0 LITRE CAR  
HIGH BASIC + G'TEE

Providing truly cost effective solutions requires a unique kind of follow through.

With computer-power, inconceivable 10 years ago, it has proved vital to have a marketing strategy which is sensitive to the needs of the end user and a programme of enhancement to suit their needs in the future.

The result is powerful but inherently flexible mini hardware, fully developed software and a support team both innovative and practical.

Combining these has accelerated the demand for the company's product and created opportunities for both the specialist and the generalist with either a commercial or technical/scientific background.

If you have a successful sales track record and the ability to manage and coordinate a high level sales campaign, telephone: DICK GLAZEBROOK on 01-405 0442 or send a brief C.V. for his attention to: High Holborn House, 49/51 Bedford Row, London WC1V 6RL. Any approach treated in strictest confidence.

**Michael Page Partnership**  
Recruitment Consultants  
London Birmingham Manchester

## FACILITIES MANAGEMENT BUSINESS SYSTEMS CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY SOFTWARE PACKAGES COMPUTER SECURITY CONTRACT STAFF SUPPORT RECRUITMENT CONSULTANCY BUSINESS SYSTEMS SOFTWARE PACKAGES

# SENIOR PROGRAMMERS • Victoria • c. £9,000

- ★ To become involved in "State of the Art" development using fully conversational IMS DB/DC.
- ★ 2 years' plus experience in COBOL with some CICS/DL1 or IMS.

- ★ A first-class Multinational Company with excellent working environment, benefits and prospects.
- ★ Candidates with some supervisory experience will be shown preference.

Ref: PJ 80188

## CHIEF PROGRAMMER

Central London

To £12K

- ★ 8/7 years' COBOL Programming - UNIVAC exp. preferred
- ★ Large involvement in Database applications
- ★ High degree of responsibility
- ★ Excellent benefits as expected of major company

Ref: PJ 81270

## ANALYST PROGRAMMERS and PROGRAMMERS

Midlax.

To c. £8K + Car

- ★ Minimum 2½ years' COBOL (pref. IBM)
- ★ Hopefully some supervisory experience
- ★ To work on development

Ref: PJ 81285

## ANALYST PROGRAMMERS and PROGRAMMERS HP 3000

Herts., City & Beds.

Max. £10½K

- ★ Developing Systems using HP3000/IMAGE/VIEW/QUERY
- ★ Requirements for BASIC & COBOL
- ★ Two requirements for SPL (will consider ICL PLAN)

Ref: PJ 81284

## HEXAGON Computer services

101 WARDOUR STREET LONDON W1V 3JJ

## PROJECT LEADERS

TEAM LEADERS ANALYST/PROGS.

Central London

To c. £14K

To c. £13½K

To c. £12K

IBM

- ★ Major development plans
- ★ Preferably PL/1 financial background although good quality is the prime consideration

Ref: PJ 80219

## REAL TIME SYSTEMS PROFESSIONALS

London, Barks., Sussex and U.S.A. Pounds Unlimited

- ★ To develop Communications System and Operating Systems
- ★ Preferably experience of PDPs or Micros, Telex, Viewdata
- ★ Excellent companies, perks and prospects

Ref: PJ 80208

## DOS COBOL PROGRAMMERS

Surrey & London

Neg.

- ★ To train in CICS DL/1 environment
- ★ Good co's and perks (including mortgage)
- ★ 1 year's experience minimum

Ref: PJ 81279

## PROGRAMMER ANALYST/PROGRAMMER SENIOR ANALYST PROJECT LEADER

Salaries to c. £12½K (under review)

- ★ Team of 8 people
- ★ To design, implement Financial Systems based on CICS/OL1
- ★ New 4300 machine

Ref: PJ 81278

## SYSTEMS PROGRAMMERS

London, Essex, Herts., Surrey Totally Negotiable

- ★ DOS, OS MVS
- ★ Junior, Medium and Heavyweight
- ★ 1 particular job to help support IBM related products, neg. + car

Ref: PJ 81263

Open until at least 8 p.m. every evening

TEL 01-439 3671

# Business Development Manager (UK)

c. £17,000

Base Salary

+ fringe benefits  
+ generous relocation package

Surrey

As part of a planned expansion programme, our Client, a leading International Computer Systems Consultancy, require a key executive to join their highly successful sales team. Concentrating on mini and micro computers, they provide a full range of consultancy, systems and software development services and products. Established for over ten years they have earned a reputation envied by many within the data processing industry today.

Ideally the successful candidate will be currently involved in major account sales, and accustomed to negotiating with major companies at Board level. Exposure to a general industry, but particularly an electronics environment would prove to be extremely useful, be it in a service or product sales market area. It is of great importance that the successful candidate should reside within Surrey in order to maintain close contact with the Company's Headquarters.

Remuneration is by way of a base salary of circa £17,000 plus an excellent range of fringe benefits including a prestige company car, assisted pension scheme, permanent health schemes and if required, generous bonus and full relocation package.

For further information and an immediate confidential interview telephone Chris Fry on 01-935 0671 (24 hour answering service) or 01-637 8795 (evenings, Monday-Thursday) or 021-742 1992 (at weekends).

هكذا عن الأصل

London 01-935 0671 3 Mandeville Place, Wigmore Street, London W1M 6LB  
Birmingham 021-250 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY  
Manchester 061-333 0427 Blackfriars House, The Paragon, Manchester M3 2JA  
Bristol 011 322 840 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles  
Amsterdam 010 3120-780847 Willem van der Grinten 32, 1071 H.M. Amsterdam

ONE



# DALROTH computer personnel

## GST Computer Systems Ltd.

GST Computer Systems Ltd. is a well-established software/systems company based near Cambridge. The Company specialises in technical areas and does not involve itself in data processing. Despite the recession, we have steadily increased our workload by providing quality work at reasonable prices. All technical staff receive a company car, expenses, profit sharing and an above-average salary. Vacancies exist over the next three months, but please only apply if you are above average ability.

### 1. CAMBRIDGE BASED

CONSULTANTS: minimum £10,000+ car

**Microprocessor Consultant** with an in-depth knowledge of micro-technology, both hardware and software and wide experience of different microprocessors in technical applications. To lead projects and advise clients on all aspects of microprocessor technology. Electronics background advantageous.

**Industrial Automation Consultant** with in-depth experience of process control and data acquisition applications in industry using micro and/or mini based control systems. To lead projects and advise clients on all aspects of industrial automation. Good instrumentation experience useful.

**CAD/CAM/Graphics Consultant** with in-depth experience of CAD/CAM and good knowledge of graphics systems. To liaise with existing client base and to advise clients on selection, installation and use of CAD/CAM.

All consultant positions involve marketing and sales support and there are excellent opportunities for performance related bonuses.

### 2. UK BASED

A wide variety of assignments with clients to design and develop software in many interesting and challenging technical application areas. Some fixed term contracts will be considered, in which case a substantial terminal bonus will be paid for successful completion of project.

Designers, min. £8,500 + CAR or £270+ per week.  
Analysts, min. £8,000 + CAR or £240+ per week.  
Programmers, min. £7,000 + CAR or £220+ per week.

#### Requirements include:

Fortran, Prime or similar, graphics applications (several vacancies at all levels). Fortran any mini CAD/CAM applications.  
Fortran mini scientific and automotive applications.  
Coral 86, real time, GEC 4080 or similar, various applications.  
IBM 370 assembler, system software applications, telecommunications.  
HP1000, systems programming.  
Macro II, RSX11M, PDP11, UNIX, various technical applications.  
VAX, UNIX, VMS, systems programming applications.  
PDP11, UNIX, PASCAL, graphics and typesetting.  
Microprocessor, assembler, 8085, Z80, M8800, various technical applications, all levels needed.

### 3. EUROPEAN BASED

Primarily in Holland or Belgium, the assignments are for various clients for periods of 6 or 18 months. Additional benefits include generous expenses, paid additional home visits and assistance in foreign tax and settling in. Some fixed-term contracts will be considered in which case a substantial (possibly tax-free) terminal bonus will be paid.

Designers, min. £15,000 + CAR or £400+ p.w. package.  
Analysts, min. £14,000 + CAR or £360+ p.w. package.  
Programmers, min. £13,000 + CAR or £330+ p.w. package.

#### Requirements include:

RTL/2, minis, process control and technical applications.  
Philips P800, any language or operating system, various applications.  
DEC system 20, systems programming.  
PDP11, RSX11M, various assignments.  
Microprocessors, assembler and/or PL/M, 8080, Z80 etc.  
MUMPS, any machine, program development.

For further information please contact Roger Allington on 01-493 2847 (office) or Berkhamstead (04427) 2286 (evenings and weekends) quoting Ref. CVI 8852.

DALROTH & PARTNERS LIMITED  
4 HALF MOON STREET, LONDON, W1

## Botswana

### Principal Programmer

Up to £13,200 plus allowances

Candidates, preferably between 30 and 50 years of age, should possess an HND with at least six years' post qualification experience or at least 10 years' programming experience on a wide range of installations ideally including some scientific programming. Experience as a Team Leader with training ability would be advantageous as would experience on ICL Computers using Mextimup and TPS.

The successful candidate will be responsible to the Computer Manager for the efficient operation of his team.

Salary includes a substantial tax-free allowance paid under Britain's overseas aid programme. Basic salary attracts 25% tax-free gratuity.

Benefits include free passages, generous paid leave, children's holiday visit passages and education allowances, appointment grant and interest-free car loan.

For full details and application form phone Jane Holland on 01-222 7730, ext 3514, or write quoting YRIA/301/CD.

### Crown Agents

The Crown Agents for Overseas Governments and Administrations, Recruitment Division,  
4 Millbank, London SW1P 3JD.

## Computing Systems Manager

To manage the facilities and resources providing a major laboratory computing service for a large variety of tasks ranging from scientific computations to CADwork for LSI and VLSI circuits. Facilities available include a VAX/11/780, a DEC 4085, an Apple Colour VLSI Design System, an RJE line with large mainframes, and several minicomputers dedicated to specific projects. The responsibilities of the manager will include:

- \* Collecting, channeling and advising on requests for new equipment and software and recommending developments and extensions to the facilities.
- \* Providing an operator service and expert program advice for the multiterminal machines.
- \* Responsibility for the RJE facility.
- \* Matching of users and jobs to the requisite machines.
- \* Provision and dissemination of information for software and hardware on the various minis, and recommendation of stand-alone small processors for specific tasks.
- \* Setting up appropriate systems software expertise where necessary.

The man or woman appointed must have sufficient experience and expertise in computer science and systems to be able to play an innovative role in all the above tasks.

Please write, giving brief details, to: G. O. Pritchard, Administrative Manager, Ref. P702, GEC-Hirst Research Centre, East Lane, Wembley, Middlesex HA9 7TP, or telephone 01-904 1262 Ext. 210.

**SBC**

**ANALYST** **TESTS** **to £9,000**  
Support roles, RAMIS or ICCP or ETAS with FORTRAN or BASIC on IBM Hardware.

**PROGRAMMER** **TESTS** **to £7,000 + car**  
Minimum 2 years on IBM/COBOL.

**LEAD PROGRAMMER** **TESTS** **to £9,000**  
Minimum 3 years, IBM/COBOL.

**ANALYST** **TESTS** **to £9,000**  
Minimum 18 months on IBM Hardware.

**PROGRAMMER** **TESTS** **to £9,000**  
Minimum 18 months on IBM Hardware.

**ANALYST** **TESTS** **to £9,000**  
Minimum 18 months on IBM Hardware.

**PROGRAMMER** **TESTS** **to £9,000**  
Minimum 18 months on IBM Hardware.

**COBBLE**  
COBBLE BLACKBURN LTD  
The largest and most successful turning machinery manufacturers in the world  
have the following vacancy:  
**SYSTEMS ANALYST/PROGRAMMER**  
Applications are invited from those offering at least three years' experience and a proven track record in the development of manufacturing systems and capable of initiating projects from inception to completion with a minimum amount of supervision. Ideally the successful applicant will have the ability to delegate and supervise where necessary.  
Our computer is an ICL System 15, currently working in assembler and will shortly undergo a major upgrade.  
The position will be both demanding and interesting for which we offer a competitive salary and conditions of service.  
Applications in writing from both male or female, with details of experience to:  
The Personnel and Training Officer  
**COBBLE BLACKBURN LTD.**  
GATE STREET, BLACKBURN  
BB1 3AH

### SYSTEMS ANALYST

£7,000 to £11,000 p.a.  
ON-LINE DATA BASE PRODUCTS  
IBM 4341, IN SURREY

Our latest expansion to meet our growing work load gives rise to a vacancy for a Systems Analyst to work in a team developing an interesting range of new systems in a DL/I, CICS environment. Involvement also with minis, word processors, etc.

A sound background in computing, a lot of ability and some relevant experience are the minimum requirements.

A JUNIOR SYSTEMS ANALYST is also required to augment our team. Less relevant experience expected and training will be given as necessary.

Starting salaries, according to experience, in the range quoted above. A week's holiday. Car allowance. Excellent working environment in a go-ahead yet secure organisation providing a bureau-type service to public service organisations.

To apply send a brief C.V. or telephone Doug Kenward, the Development Manager, for an application form of more details.

K & S COMPUTER CENTRE  
Green Lane, Worcester Park, Surrey  
Telephone 01-337 4403

### JOIN THE MODERN BUREAU SCENE

**PROJECT LEADER (Programming)** **neg. circa £8,000**  
To lead a small team of programmers and analysts/programmers in signing and developing DDP Applications using IBM 4100 hardware, and COBOL. Several years' experience of systems design and programming required.

**ASSEMBLER PROGRAMMER** **neg. circa £9,000**  
Suitable applicants will have at least 2 years' IBM Assembler/COBOL programming experience, preferably in a COBOL/VS/COBOL environment. An interest in progression to systems programming would be useful.

**CONTRACT PROGRAMMER & ANALYSTS**  
We have available a number of contracts for experienced personnel in any of the following fields:  
\* IBM ASSEMBLER (Application)  
\* MAINFRAME  
\* SYSTEMS ANALYSIS (Financial)  
\* VITAL APPLICATIONS  
\* COBOL/VS/COBOL (Data Base)

Competitive rates and package are provided

For further details send c.v. or phone Jim Cade on 0742 790191, Smithfield House, Blunk Street, Sheffield, S1 2BU

**GMS**  
A MEMBER OF THE JOHNSON PATH BROWNE GROUP OF COMPANIES

### BE A SYSTEMS & PROGRAMMING CONSULTANT

Central London company seek people with 2 years' experience on any mainframe. Good company benefits and excellent promotion prospects.

SALARY TO £10K  
For details ring Sue Ashby on Amersham (02463) 22201

**PROGRAMMING & SYSTEMS LTD**

This advertisement is about something different

## Computer Operations Manager

### N.W. England

# £14,000+ car

To be of interest to our client you must already be successfully managing a medium/large IBM mainframe installation. You must certainly be a dedicated professional with total commitment and most definitely not of the 9.00 to 5.00 mentality nor seeking a quiet life.

### Question Answer

What is it that is so different?

- INVOLVEMENT in wide management issues
- INVOLVEMENT in budgeting
- INVOLVEMENT in fixing and negotiating user charges
- INVOLVEMENT in expenditure control
- INVOLVEMENT in revenue monitoring

These are some of the specific areas of involvement that so often are not within the sphere of control of most Operations Managers. So often Operations Managers complain that their role is really little more than ensuring that the work gets done on time—in fact a Production Manager.

### datascene

## OPERATORS

**IBM OS/VS1 OPERATORS** **c. £6500+**  
Financial company requires Operators and Sys. Operators with 18 months' to 2 years' experience of VS1/VS2 with LMS. A knowledge of T.P. will be an advantage. Very good perks. G.957

**IBM OS OPERATORS** **£6000-£8000**  
We have a number of clients in London and Home Counties who require VS Operators with a good knowledge of the following VS1, VS2, JLS2, JES3, VS1/VS2. Good JCL will be an advantage. If you are interested please contact me. G.958

**IBM MVS JES2 OPERATOR** **LONDON c. £6000**  
Very large transport company require Ops with a min. of 1 year's exp. of MVS JES2. Good opportunities for progression. G.5055

**IBM OS VS1 SNR. OPERATOR** **DORSET c. £6500**  
Large financial company require operational staff with a min. of 2 years' OS/VS1 using MVS and CICS. Very good company package includes mortgage, Life Assurance, restaurant, sports and social, etc.

**IBM OS/VS1 DATA CONTROL** **LONDON c. £5500**  
Ovenson Bank requires Data Controllers. Good OS JCL and utilities a must. Good company package includes mortgage, etc.

**BURROUGHS OPERATORS** **c. £6500**  
We have a number of clients in and around London who require Burroughs Operators. Experience varies but if you have MCP or MCPV experience then I would like to hear from you. AMOEN

**PDP 11/70 SUPERVISOR** **c. £8000**  
This company based in North London are offering an excellent opportunity for an experienced staff leader or supervisor to take charge of this expanding installation. Good communications knowledge essential. Good benefits. Package includes 22 days' holiday, free pension scheme and staff restaurant. B4206

**PDP 11/70 OPERATORS** **c. £7000**  
Large International Company City based, require an operator with min. of 12 months' experience working with any operating system, two shifts only. Good career structure. Excellent fringe benefits. B5167

**PDP 11/70 D. CONTROL/OPERATOR** **c. £6000**  
Our client based in N. London requires an experienced person, PDP prof., any essential. To be involved in all areas of D.P. Days only. Excellent pay, benefits, URGENT! B5266

**ICL 1900/2900 OPERATORS** **c. £7000**  
We have several vacancies based at the City office in London. Min. of 12 months' exp. Please phone for more details. B5267

**datascene** **01-439 7871**

True, our client wants that to be done as well, as it is by the service provided that operations is judged by users, but much more we can offer that extra dimension of responsibility and involvement. In fact this job is like managing your own business. You will be allowed to manage and your own management will ensure that you are provided with the scope and opportunity that a real manager demands.

You will control an expanding IBM mainframe installation with direct responsibility for data control, computer room, network operations and all systems software support and development.

You will be expected to provide a totally dependable service to a number of user companies within the Group maintaining tight control of operational costs within financial parameters agreed with users.

You will also have to be able to maintain service levels in an environment where the processing volumes are subject to a major seasonal fluctuation—of up to seven times the average—and this lasts several months.

If you feel you are the right person for this opportunity which can really extend the scope of your career then contact Ivor Norton, quoting reference number CW/8106, at the Harrogate Office. If you are the candidate we are seeking then our client will negotiate an attractive remuneration package which will include a salary of not less than £14,000, plus company car, non-contributory pension, BUPA and generous relocation expenses if appropriate.

## Ivor Norton Management Services Ltd.

LONDON: 62, Shaftesbury Avenue, London W1V 7DE, 01 734 8882  
HARROGATE: P.O. Box 83, Capital Tower House, Harrogate HG1 1TB, Harrogate HG82E  
GLASGOW: 11 Bathwell Street, Glasgow G2 8LY, 041 228 4811

24 HOUR ANSWERING SERVICE (0423) 55311

## Freelance Assignments

We need reliable professional people to work on interesting contracts in London and the Home Counties

- ★ BUREAU SUPPORT — OS, VM/CMS
- ★ SNR. PROGRAMMER — 8,100, DPPX
- ★ ANAL/PROG — COBOL, CICS
- ★ ANAL/PROG — SYSTEMS IMPLEMENTATION
- ★ PROGRAMMERS — COBOL, CICS

Contact us now and reap the benefits of working for a Software House  
Ring: Sheila Fox  
**Link Associates Limited**  
24a High Street, Chesham, Bucks. (02405) 4922



## DALROTH Computer Personnel

**OPERATORS AND SENIOR OPERATORS** **to c. £11,000 + benefits**

**Saudi Arabia**  
Our client is looking for experienced operations staff for their rapidly expanding installation in Saudi Arabia. The hardware comprises an IBM 370/148 and a 3031, shortly to be upgraded to a 3033. MVS experience is preferred, but OS/VS1 would be considered. For another project, Siemens BS2000 experience would be ideal. Our client offers an excellent benefits package including free accommodation, medical cover, 30 days' annual leave, car allowance, etc.

For further details please write or telephone Tim Armistead on 01-493 2847 (office hours) or Epsom 25394 (evenings and weekends) quoting reference 9853.

DALROTH & PARTNERS LTD., 4 HALF MOON STREET, LONDON, W1

### FOR CLASSIFIED

ADVERTISING USE

DIRECT LINE

01-661 0121

### CONTRACT

CICS DL1 ANALYST PROG

Starting April, May, June, London, Home Counties and Surrey.

IMS DB/DC/ADF ANALYST PROG

HEXABEN

Job no 173



# ata Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to industry and commerce since 1962

## SALES OPPORTUNITIES

**SELL - PETS - APPLES - PANASONIC** - Vacancies exist in Stoke-on-Trent and West Midlands. Experienced Micro or Mini Salespeople required for two separate distributors. c.£10,000 to £12,000.

**MINIS FOR SCIENTIFIC AND COMMERCIAL APPLICATIONS** - American Company require two salesmen based Sheffield/Nottingham and West Midlands. c.£15,000.

**SALES ENGINEER DATA COMMS EQUIPMENT** - Major international manufacturer. Electronics experience to HNC level. W. Midlands. c.£15,000.

**MINIS FOR ACCOUNTING** - Two vacancies in West Midlands with National company specialising in this field. Will train bright people with accounts background. c.£12,000.

**AREA SALES MANAGER** - West Midlands - To supervise team of four salesmen selling own manufactured mini computer systems and software applications. c.£24,000.

PHONE MIDLANDS OFFICE 021-643 1894

**DATA COMMUNICATIONS SALES** c.£17,000 + 2-litre Major Accounts, knowledge of IBM desirable, based Herts.

**BUREAU SALES** £12,000 + car Knowledge of Accounting Systems for Blue Chip British Company, based Herts./North London.

**MID RANGE MINI COMPUTER SYSTEMS** c.£14,000 Experience of first-time users, to sell interactive systems. Herts./North London.

PHONE NORTHERN HOME COUNTIES OFFICE  
BISHOP'S STORTFORD (0279) 506464

**LONDON**  
(01) 637 0781  
209 St. Pauls Rd. St. W. 6HP

**MANCHESTER**  
(061) 632 6856  
86 Cross St. M2 4LA

**BIRMINGHAM**  
(021) 643 1994  
Woolworth Building  
102 New St. B2 4HQ

**BISHOP'S STORTFORD**  
(0279) 506464  
29 Baslow Lane  
Bishop's Stortford, Herts

**BRISTOL**  
(0272) 211035  
Equity and Law Building  
36/38 Baldwin St.  
BS1 1TH

**EDINBURGH**  
(031) 226 5381  
Angla House  
24/26 Frederick St.  
EH2 2JH

**CRAWLEY**  
(0283) 514071  
34 The Boulevard

**SOUTHAMPTON**  
(0703) 375555  
23 Cumberland Place  
SO1 2BB

PHONE NORTHERN HOME COUNTIES OFFICE  
BISHOP'S STORTFORD (0279) 506464

WHEREVER YOU ARE, WE'RE ON CALL TO ASSIST YOUR CAREER

## ANALYSTS & PROGRAMMERS

**PROGRAMMERS** to £7,500 + Sub. Mortgage  
Extensive PLAN experience based South Birmingham.

**PROGRAMMER/ANALYSTS** c.£8,000 + use of pool car  
Commercial experience in BASIC and n/c code using PET, APPLE and NATIONAL PANASONIC - South Birmingham.

**PROGRAMMERS** to £7,000 + prof. mortgage  
To join Technical Support Team of a large IBM installation. Experience of COBOL/BAL/CICS. Based West Birmingham.

**PROGRAMMERS** to £7,000 + prof. mortgage  
In depth knowledge of BASIC on DEC Hardware - Leicester.

**DATA PROCESSING MANAGER** to £12,000 + car  
To create new department using DEC Hardware. Must have solid PDP experience - West Bromwich.

**PROGRAMMERS** to £8,500  
2 year COBOL/BAL required. CICS & OLI an advantage but training will be given. - South Birmingham.

PHONE MIDLANDS OFFICE 021-643 1894

## HERTS/ESSEX/ CAMBS

**Junior Programmer** 1 year IBM COBOL to £6,500  
**Programmer** 2 years IBM COBOL c.£7,500  
**Systems Programmer** 2 years IBM CICS, VM c.£8,000  
**Dep. Ops Manager** ASSEMBLER c.£8,000  
**Programmer** 2 years IBM COBOL + c.£8,250  
**Senior Programmer** OS, JCL c.£8,500  
**Principal** 3 years ICL/UNIVAC c.£9,000  
**Programmer/Analyst** COBOL c.£9,500  
3 years IBM COBOL  
3 years Macro  
Assembler/ATE

## GLOUCESTERSHIRE SOFTWARE & HARDWARE ENGINEERS

A Blue-chip British Company have an urgent requirement for experienced Software Designers/Programmers and Hardware Designers. You will be working on the development of a complex control system based on INTEL 8085's linked to POP11/34's.

## SOFTWARE ENGINEERS

You should have experience in high-level technical languages ideally CORAL 66, PASCAL, ALGOL and have some compiler knowledge.

## HARDWARE DESIGNERS

Experience of board design using TTL and CMOS logic. The project will involve evaluation of microprocessors and Subtle memories.

**FULL RELOCATION EXPENSES**  
PHONE 0272 211035  
ATA COMPUTER RECRUITMENT  
Equity and Law Building  
36/38 Baldwin Street  
Bristol 1

## MANAGEMENT & EXECUTIVE SELECTION

telephone  
01-637 9611

# ENGINEERING CONSULTANT

## London c £10K

This position will appeal to an experienced computer engineer who has advanced well but who is now looking to broaden his base of skills.

You will be working in a team environment with experienced consultants for a major independent recruitment consultancy which is highly respected by the industry for the quality of its recruitment services.

You will be required to negotiate, liaise and plan recruitment campaigns at engineering management level on behalf of our clients, many of whom are the foremost names in the computer industry.

To discuss the position further call Howard Wynne, Manager, Computer Engineering Division on 01-637 9611.

Suite 201/6 Albany House  
324 Regent Street London W1

MANAGEMENT & EXECUTIVE SELECTION

## SIX OF THE BEST OF REAL TIME MINI

1. LONDON: you need experience of technical/industrial/military projects, using Assembler and high level language. You may need to be mobile, too.
2. BEDS: They'd like two or more years' experience of DEC RSX11, using Fortran for process control or spectrometry or analytical measuring systems. Junior to Team Leader level places available.
3. HERTS: Small software house says you should have 4 years' plus Real Time Assembler and high level language for industrial automation, communications, etc.
4. ESSEX: Positions up to Project Management level if you have 4 years' or more experience of Real Time Assembler on radar systems.
5. HANTS: Only if you're a car driver, willing to be mobile! Any Real Time Mini-Micro experience on any of the applications below.
6. GLOS: You need Coral or DEC Assembler experience. Familiarity with Intel 8000 series is an advantage. Application: Real Time flight control systems.

Many more! Applications include Process Control, Communications, Military Systems, Systems Simulation, CAD Graphics, Real Time Operating Systems, Compilers and Language Processors, Networking.

In general, current Real Time Mini places require at least 3 years' Mini/Micro experience. But we're especially interested if you have DEC RSX11, using macro and/or Coral, Fortran, Algol, Pascal - or Intel 8000 Series using Z80's. Other machine languages? Yes. Please tell us. Salaries: up to 14K, maybe more in some cases.

So get the best of Real Time Mini. Call Beryl McLaren (same girl) any time, day or night. Suites 41/42, 12/13 Henrietta Street, London, W.C.2. Telephone 01-836 9719 or 01-836 9882

**Jupiter**

Computer Appointments

(REAL TIME MINIS PLACE)  
Suites 41/42  
12-13 Henrietta Street  
London, WC2. Tel. 01-836 9719  
or 01-836 9882

Sprechen Sie Deutsch?

Cultivate a Swiss accent! Put your System 'X' software or other communications experience to work Alps-side.

(08161)

# Analysts & Programmers

earn c. £9500

in Aylesbury Bucks

Rank Xerox is a highly successful multi-national company, internationally famous for reprographic and business equipment.

What we can offer is an environment where computer specialists can really feel at home, working in a team where professionalism and experience is praised, appreciated and well rewarded.

Do you match the requirements of one of the following?

## Lead Analyst

For the analysis and development of enhancements and amendments to large COBOL batch systems.

You should have three years' programming experience in COBOL, a good knowledge of IBM OS/MVS/CL Easytrieve and a minimum of one year's analysis experience.

## Lead Programmer

To control and implement enhancements to complex batch COBOL systems, together with the opportunity for involvement in future mini based systems development.

You should have a minimum of three years' commercial programming experience using COBOL and a minimum of a year on large IBM mainframe.

## Lead Analyst

For the design through to implementation of mini based order processing systems.

You should have experience with hardware in a real time environment through all phases of a project together with the ability to plan and control own work and that of others and to liaise with all levels of system and user personnel.

All applicants should possess a current driving licence as some travel in the UK and Europe will be necessary. All three positions offer significant career development. The salary and benefits package is excellent and includes company pension scheme, free BUPA, four weeks holiday - rising to five, generous relocation package and subsidised staff restaurant.

To apply, please write with career details or telephone for further information and an application form to Christine Appleton, Rank Xerox Limited, Hampden House, High Street, Aylesbury, Bucks. Telephone Aylesbury (0296) 33123 Ext. 2147

RANK XEROX

## EXCITING OPPORTUNITIES

FOR

# SALES EXECUTIVES

## BASED IN MANCHESTER

A BRITISH MINI COMPUTER MANUFACTURER OFFERS THE FOLLOWING:

★ A NEW LARGE BRANCH WITH EXCELLENT DEMONSTRATION FACILITIES.

★ HIGHLY COMPETITIVE HARDWARE AND SOFTWARE ON A PRICE PERFORMANCE BASIS.

★ A PROVEN EXTENSIVE RANGE OF APPLICATION PACKAGES FOR COMMERCE AND INDUSTRY.

★ HIGH-LEVELS OF PRE- AND POST-SALES SUPPORT.

REMUNERATION FOR WINNERS.

FIRST YEAR'S GUARANTEED SALARY IS APPROXIMATELY £10 K.

EARNINGS ON £200 K. QUOTA ARE APPROXIMATELY £19 K

OVERQUOTA COMMISSION IS 8%.

FOR FURTHER DETAILS CONTACT:

JOHN BELLAMY AT:  
INSIGHT MARKETING AND PERSONNEL CONSULTANTS LTD  
AUSTIN HOUSE, CHARLOTTE STREET, MANCHESTER  
TELEPHONE: 061-236 7026

هذه من الأصل

(0811)





# Shell Chemicals

## COMPUTING PROFESSIONALS-CENTRAL LONDON

Shell Chemicals are sophisticated users of computing technology embracing data base and on-line systems developments impacting on all areas of the business. We are in the process of establishing a development group in our central London (Strand) offices to satisfy a growing portfolio of developments for Head Office and corporate systems. We require people who have a similar professional approach to computing as ourselves and in particular:

**SENIOR ANALYSTS—salaries up to £14,000 p.a.**

capable of identifying business requirements and with a proven track record in information planning, analysis and project management.

**DESIGNERS—salaries up to £10,000 p.a.**  
experienced in on-line systems design under IBM, CICS, DL1 and Data Dictionary experience would be an advantage.

**PROGRAMMERS—salaries up to £10,000 p.a.**

with at least 3 years IBM Cobol experience and fully conversant with CICS, DOS/VSE and structured techniques. DL1 experience would be an advantage.

We would like to hear from men or women who can meet the above requirements and wish to enjoy the benefits of a computing career with Shell. Other benefits include London Allowance, an excellent contributory pension scheme and, where appropriate, generous relocation expenses.

In the first instance, please telephone or write for an application form to:-

Pam Blythe, PRR/12, Shell Chemicals UK Limited,  
Manchester Road, Urmston, Manchester M31 4AL.  
Tel: 081-776 3417.

## CONTRACTS HOLLAND

c £350 to URGENT

c £750 PER WEEK URGENT

### LONG-TERM CONTRACTS

Our clients require Analysts with experience of PDP's, preferably in a process control environment. A working knowledge of Dutch would be a distinct advantage, though not essential.

This is an urgent requirement so send your C.V. without delay, and telephone Geoff Cave to arrange for an early interview.

## TELECOMMUNICATIONS SOFTWARE ENGINEERS

IBM PL/I or COBOL PROGRAMMERS

IMMEDIATE U.K. START

1900/2900 FORTRAN Programmer PDP 11

RSX 11M DECNET Programmers—IBM

4300 CICS—Cobol Programmers

IBM 8100—Cobol Programmers

PRIME Cobol Analysts and Programmers

NCR NEAT III—Programmers

For further details phone JANET—021-622 3040

## MVS Implementation

**France to £2,200/month**

We are seeking an experienced Systems Programmer to implement MVS/SP at a twin 4M 4341 installation. The assignment is an open-ended one, initially for 8 months, at an attractive location in central France. Applicants should have at least 3 years systems programming experience, including one year or more of MVS work, and must be prepared to take on responsibility for all aspects of the implementation.

## IMS Technical Support

**Holland £1,900/month**

We are seeking a technically oriented Analyst Programmer to work with a small team in the Netherlands on the development of an international data collection and distribution system based on a centralised IMS Database. Duties will include the provision of IMS technical support to the group as well as the design and implementation of enhancements to improve system efficiency. In addition to a thorough knowledge of IMS DB/DC candidates should have Cobol experience and a knowledge of assembler would be an additional advantage.

CDS is a 45 strong Anglo-Swiss Consultancy specialising in the following areas:  
• Systems Programming—MVS, VS1, VM, OS/VS2, ACF, MVS, CICS/VS.  
• DB/DC Application Development—Particularly IMS DB/DC, DL1 & CICS.  
For further details of the above positions or for an informal discussion on future European or UK assignments please contact us at our UK office or on our private numbers at weekends. When contacted please quote 0203 or Jim Shaw 0203 2414.



**The IBM System Software Specialists**

# MYRIAD

## SENIOR SYSTEMS ENGINEERS

### OFFICE SYSTEMS FOR THE EIGHTIES

#### NORTH WILTS

**£10,000-£13,000**

We are seeking enthusiastic and well-motivated senior engineers to join a specialist group which has responsibility for the evaluation, definition and development co-ordination of advanced systems for Telecommunications and Information Processing.

The Group has a major development plan which, in conjunction with the existing products, will enable the company to make a major impact upon the Office Systems market of the next decade.

The successful candidates will offer a proven background in systems development including substantial experience of one, or more, of the following areas:

★ Hardware development of digital electronics in communications and computer interfacing

★ Software for computer communications and filing systems, editors, etc.

★ Digital systems simulation for modelling future business systems

★ CCITT standards and protocols for digital information exchange.

Engineers will be educated to degree level, be prepared and able to take a total system approach, and be sufficiently experienced in one or more of the above fields to take a given project to completion.

These positions offer excellent scope for technical originality in a demanding and exciting field. Conditions of employment are excellent and include comprehensive relocation expenses where appropriate. To discuss the scope of these opportunities in detail and arrange an interview either telephone Myriad on the number below or write quoting reference

RN3/1903/CW.

## TELECOMMUNICATIONS SOFTWARE DESIGNERS

### WILTSHIRE £ NEGOTIABLE

One of the market leaders in the field of telephony systems, our client is seeking additional Senior Software Designers/Programmers who will play a major role in the development of the new generation of fully digital telephone switching systems.

The successful candidates will offer experience of:

- ★ Telephony software development
- ★ Mini and micro systems
- ★ High-level languages (CHILL/PASCAL/CORAL)

The company offers excellent conditions of employment including high base salaries and relocation expenses where appropriate. To discuss the organisation and these positions in detail telephone Myriad on the number below. Alternatively write, quoting reference

RN4/1903/CW.

## BUILD A DEC NETWORK UXBRIDGE £9-£10½K

A recently-installed PDP 11/70 forms the heart of a distributed processing network that will support twelve remote sites, thereby providing advanced interactive systems for local users.

The Software Group is now seeking to expand its team of specialists by recruiting a TECHNICAL PROGRAMMER with RSTS/E operating system experience. BASIC + 2 knowledge is highly desirable but applicants with a sound hardware and telecommunications background will be equally considered, as the Group is currently tuning and further developing the network.

- ★ RSTS/E
- ★ REMOTE TERMINALS
- ★ TELECOMS. SYSTEMS
- ★ REAL-TIME SOFTWARE
- ★ RMS/FMS TRAINING
- ★ BASIC + 2

The Company is proud of its international reputation as an employer offering a secure and positive future along with a first-class benefits package, including relocation expenses where appropriate.

REF: S1/1903

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA Telephone: 01-351 1981 24 hours

Job in 1/10



# Systems Analysts and Computer Operations Supervisors

Your Real Time Minicomputer Experience could be worth £20,000 after tax in Saudi Arabia right now. INFORMAL INTERVIEWS IN LONDON AND MANCHESTER

Our client, the world's largest oil producing company, is actively involved in assisting the Saudi Government in major infrastructure development programmes.

A major project involves a sophisticated network of Hewlett Packard 1000E minicomputers linked together by a microwave communications system to provide a substantial data base.

This new turnkey contract is in the process of delivery and comes on-stream in 1981. It provides a unique opportunity for ambitious Systems Analysts and Operations Supervisors with real-time minicomputer experience to gain rewarding career experience overseas.

An attractive compensation package includes low-cost air-

conditioned accommodation, medical care, generous leave, excellent recreational facilities and the opportunity of truly substantial capital accumulation.

Find out more. We will be holding informal interviews at our London and Manchester offices next Monday and Tuesday 30 and 31 March, 1981 from 3 p.m. until 8 p.m. If you cannot make these times, telephone Patrick Shaw any day during normal office hours on 061-228 6521 or Andrew Duncan-Brown on 01-631 4411 or write, quoting reference number MDK/9015 to Moxon Dolphyn & Kerby Ltd., York House, York Street, Manchester M2 3BB or Moxon Dolphyn & Kerby Ltd., 178-202 Great Portland Street, London W1N 5TB.

**MOXON  
DOLPHYN  
& KERBY LTD**

A Division of SOS Bureau Ltd

**The SOS Group**

Trading as:

SOS Staff Bureau

SOS Industrial Staff

SOS Senior Appointments

**FIELD SERVICE TECHNICIAN £20,000** Paid overtime and benefit. Microprocessor Control Equipment. **FIELD SERVICE TECHNICIAN £25,000** Stand-by allowance. Peripheral Equipment Software Training. **SALES EXECUTIVE £20,000** £15,000. Possible earnings East England Business Computers.

**SYSTEM SUPPORT ENGINEER £20,000** Programme controlled communication systems. Commission Systems and Provide Technical Support. **SUPPORT ENGINEER £20,000** Advanced systems weapon systems. Assess performance of System Software and Integration of Hardware. **COMPUTER MAINTENANCE TECHNICIAN £20,000** £12,000. Mainframe and/or Peripheral Equipment. Experience.

For these and many other vacancies, nationwide, please contact LEE WOOD, 567 7466, 71 THE MALL, EALING, LONDON W5 5LS.

**Analyst Programmer Up to £9,795**

**Cobol Programmer Up to £9,363**

At the London Borough of Harrow we've expanded our computer function. We have an IBM 4341 operating under VM and QOS/VS, providing both batch and on-line service, and teleprocessing is under the control of SHADOW II. Our plans include the growing use of data base and teleprocessing techniques.

This is all part of a structure created to develop and install new projects. Our applications include Libraries, Forward Planning, the Area Health Authority, the Electoral Roll, Engineering and Architects Departments as well as the usual financial applications.

To carry through this ambitious plan we require first class and experienced men or women. Applicants should have a proven ability in COBOL programming, preferably on IBM equipment. A sound working knowledge of systems design is necessary for the position.

We can offer many benefits and advantages: flexible working hours, a package for suitable applicants, 23 days' holiday, season ticket loans, pension scheme, sick pay, etc. Pleasant modern offices with subsidised restaurant and staff shop. Easy access by public transport and ample parking.

Shops, restaurants and a superb leisure centre within a few minutes walk. And excellent prospects for both job advancement and career development. For further information and formal discussion, contact our Computer Manager, Gerald McDonough on 01-863 5611, ext. 2202.

Written applications should be sent to the Computer Manager, London Borough of Harrow, PO Box 21, Civic Centre, Harrow, Middlesex HA1 2UL.

**Harrow**

## TP Systems Programming

**SOUTHAMPTON** up to £10,500

At our Southampton Computer Centre, we at Southern Gas have a large developing IBM 3032 and 3031 installation under OS/VS1 (shortly to become MVS) pending on-line facilities to over 400 local and remote terminal users. Software installed includes ACF/VTAM, ACF/NCP, NCCF, NPA, CICS/VS, IS, VSPC, VSAPL, DL/I and ROSCOE. Future plans include NPDA, MSNF and Data Dictionary.

In order to support the continued growth of new and existing CICS/VS-based on-line applications, and an increasing demand for personal computing facilities, we wish to expand the TP section of our Technical Group. This is a challenging environment and we are particularly interested in candidates who can make a positive contribution to the Group's work.

Applicants (men or women) should have had at least two years IBM systems or application programming experience and possess specialist skills in some of the following areas:

- Assembler, PL/I or COBOL
- CICS/VS
- VSPC/VSAPL/VSAPL
- DL/I

Excellent conditions of service apply; assistance given with cost of moving in appropriate cases.

For an application form please write to: Senior Personnel Officer (Recruitment), Southern Gas, 80 St. Mary's Road, Southampton, or at any time on Southampton (0703) 31616, quoting ref. R13CV.

**SOUTHERN GAS**

**INTERACTIVE MARKET SYSTEMS  
UNITED STATES**

£15-20,000

Software growing 70 percent per year. Top level computer systems engineer. The company is looking for a top level computer systems engineer. The company is looking for a top level computer systems engineer. The company is looking for a top level computer systems engineer.

DESIGNER/PROGRAMMER. The company is looking for a top level computer systems engineer. The company is looking for a top level computer systems engineer. The company is looking for a top level computer systems engineer.

For further information and formal discussion, contact our Computer Manager, Gerald McDonough on 01-863 5611, ext. 2202.

Written applications should be sent to the Computer Manager, London Borough of Harrow, PO Box 21, Civic Centre, Harrow, Middlesex HA1 2UL.

**Harlow**

## CHALLENGE INDUSTRIAL SYSTEMS REAL TIME

CAN YOU offer experience in Software Design for R/T processing?

CAN YOU take charge or be part of a team?

DO YOU have experience in any of the following:  
PDP 11, ARGUS 700, R30, FOX 3, Eclipse, GEM 80?

If the answers to any of the above questions are YES, we want to hear from you.

Digital Applications International is an established consultancy with a reputation for excellence in the application of mini and micro computers to real time processes. The Company has offices in London, Manchester and Frankfurt A.M. We are seeking people with sound experience and preferably a degree. Some work may involve travel to foreign ports, particularly in Western industrialised countries. Salary dependent on what you have to offer, but in U.K. around £10,000 plus profit sharing and other benefits.

Please telephone or write to: Barbara Daniel, 01-734 5486.  
Digital Applications International Ltd.  
Arlott House, 28 Warwick Street,  
London W1F 6HD

**DAI**

## Contracts

IBM CICS EXP. SYST. ANAL.  
IBM CQICS EXP. SYST. ANAL.  
IBM ADBAS EXP. SYST. ANAL.  
IBM OS/VS IMS ADF ANAL. PROG.  
IBM OS ASS CICS DL1 PROG.  
IBM DOS VS CICS DL1 SYST. PROG.  
IBM DOS VS COBOL CICS OR DL1 PROG.  
UNIVAC 1100 FORTRAN COBOL PROG.  
2800 EXEC APS MANAGER PROG.  
1800/2500 DME COBOL ANAL. PROG.  
PDP RSTS/E BASIC + PROG.

Immediate starts, 3 to 12 months. New contracts starting during the next six weeks.  
Phone JOHN SHARPE immediately for further details.

**Computer Search  
01-404 0152**

## The Informatics Grand Tour.

I understand you run travel straight up into management positions.

Informatics is worldwide, the locations are limitless.

Anywhere in the USA. Anywhere in the world once you're back to UK.

Dependent relocation paid in full. I guess I'll bring my wife. And my cat.

I hope they send me to Florida.

We'll be trained to a fare-thee-well on IBM data based and on line systems.

Grand indeed, salaries up to \$35,000 plus cost of living for New York City and other expensive sites.

Paid holidays, paid medical, dental and life insurance. They literally fringe you to the hilt.

Generous cash allowances in addition to airfare.

Alaska is nice if you like all that snow.

I'd like to try Detroit. Why?

Travel with Informatics is so... enriching!



Informatics will be interviewing in London and Manchester for positions in the USA during the week of April 6, 1981. To arrange a confidential expense-paid interview send resume immediately or telephone Ms. Angela Nanni at our London office (01-405 8346). Reverse charges accepted.

**Informatics Inc.**  
Africa House  
64-78 Kingsway  
London WC2B 6AL  
01-405 8548

## SYSTEMS ANALYSTS

With at least 3 years' ADP experience have an opportunity to become involved from feasibility studies to total implementation.

A few openings have arisen in an impressive and major Central London Computer Organisation structured to give maximum satisfaction within a congenial environment. The installation comprises a large ICL 2900 configuration using COBOL and IDMS as well as other supporting hardware and new developments in minis.

Systems Analysts are involved in the detailed analysis, design and specification of approved projects, both batch and on-line. Projects undertaken include general system descriptions and flow-charts, sub-system specifications, costing and staff schedules and may entail making verbal presentations.

Applicants should have not less than three years' ADP experience including at least

one as a Systems Analyst and must be professionally acceptable to the user sections with whom they will have close working relationships. Full training in the computer equipment being used will be provided.

Starting salary within the range £7,966 - £8,716 according to qualifications and experience. Promotion prospects, good holidays, non-contributory pension scheme.

Phone today on 01-439 3410 (Answering service outside office hours), and we will send an application form with a view to arranging an early interview. Alternatively, write to Confidential Reply Service, Ref: ASS 8156, Austin Knight Limited, London W1A 1DS. Applications are forwarded to the client concerned therefore companies in which you are not interested should be listed in a covering letter to the Confidential Reply Supervisor.

## PROGRAMMERS

With at least 18 months' experience have an excellent opportunity to take a leading part in a small development team.

The programming development covers design, coding, testing and documentation within a small team environment enabling Programmers to support team leaders and guide trainees.

Applicants should have at least 18 months' programming experience which should include working under an advanced operating system and participation in the successful

implementation of a large system. Experience of a transaction processing system and knowledge of IDMS would be an advantage. They should possess a high degree of self-motivation and will be expected to take a leading part in the work of the team. Starting salary within the range £5,916 - £8,446 according to qualifications and experience. Promotion prospects, good holidays, non-contributory pension scheme.

**LONDON BOROUGH OF BROMLEY  
BOROUGH TREASURER'S DEPARTMENT  
SENIOR  
COMPUTER  
OPERATOR**  
£12,500-£13,500  
+ 14% shift allowance

Applications are invited for this most important position through a Shift Leader for the operation of Council's ICL 1907 192K computer. The Council's operating system is used to support in this region of City and the terminal plus batch processing. The machine will be replaced early in 1982 with an ICL 2900 model using the CMS operating environment in conjunction with VM/SP. Experience - a minimum of two years' experience in operation of the Council's ICL 1907 192K computer. Application forms from Assistant Chief Executive (Head of Manpower) or from the Shift Leader, Bromley, Kent. Tel: 01-464 2312, ext. 2315. Closing date 31st March, 1981.

**HP3000  
COBOL  
PROGRAMMER**  
2 years' experience  
£10,000-£12,000  
C/O: BOB GREEN  
COMET SYSTEMS LTD.  
11, 12, 13  
Rushmore 01-904 7844

**CONSULTANT  
PROGRAMMERS/  
ANALYSTS**  
Three years' experience. Circ.  
£13,000-£15,000  
CITY CENTRE BUREAU  
TEL: 01-405 8346

## Midlands

Our clients are currently seeking Senior Operators, Shift Leaders and Support Staff for a large scale installation of IBM 4341/4381. Company are offering very good career prospects with a salary range of £10,000-£17,000. Excellent benefits together with a pension scheme. For further information and formal discussion, contact our Computer Manager, Gerald McDonough on 01-863 5611, ext. 2202.

Written applications should be sent to the Computer Manager, London Borough of Harrow, PO Box 21, Civic Centre, Harrow, Middlesex HA1 2UL.

**Harlow**

## CONTRACTS

**HONEYWELL IDS/TDS ANALYST/PROGRAMMER**

Starting April for London and South-East

**NCB HEAT 3 LEVEL 2 PROGRAMMERS**

Starting A.S.A.P. for London

Phone NOW! 01-423 2166 or 01-423 1863

**VIKING RECRUITMENT LIMITED**

Viking House, Peterborough Road, Harrow, Middlesex, HA1 2XU

## COMPUTER CAREERS IN AUSTRALIA

**For the kids!**

If you have 3 years relevant current D.T. experience write for details and brochure to S.M.I., Agent General for Victoria, Victoria House, Strand, London W.C.2B 4UG. Interviews will be held in London and Manchester during July 1981.

Up to £12,000



(NW1654)

(NW1595)

(PK1660)

**THE**

## (NW1622)

(PK1645)

## (NW1582)

(JA1659)

(JA1662)

(PK1636)

12-11-68

## MANAGEMENT & EXECUTIVE SELECTION

CW.13/1 Мелнуг

CW 13/1 Mervyn

CPS. If your experience is relevant, contact us now for further details. CW 13/9 Tricia

club, CPS, and free life insurance. CW 13/10Tdc

## CIV-13711 Michael

Norwich House, 13 Southampton Place, London WC1A 2AA

15/11/1944

**UNIVERSAL COMPUTER ASSOCIATES LIMITED** Recruitment Consultants 01955 3883 (01958 6138 Evenings)  
Data Express House, 3 Promenade Place, Heathfield Terrace, Chiswick, W



